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Adaptation

Climate Change Adaptation in Africa

Final Report

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Cover Photo Credits

***Top left**: IDRC/ Djibril Sy*
Unloading the pirogues on the beach, a CCAA project on Fishing Policy in West Africa.

***Top right:** IDRC/ Mohammed Yahia*
The coast of Egypt under study in a CCAA project on Sea Level Rise in the Nile Delta

***Middle left:** Kenyan Medical Research Institute (KEMRI)*
Researchers conduct blood testing for a study on malaria incidence in a CCAA project on Malaria Epidemic Prediction in East Africa

***Middle right:** IDRC/Thomas Omondi*
Researchers worked with farmers in Kitui, Kenya to adapt agricultural practices to a changing climate under a CCAA project on Managing Risk in the Horn of Africa

***Bottom left:** Golder Associates*
A CCAA project on Water Management in Urban South Africa addressed adaptation in areas such as the Amaoti flood plain in Durban, South Africa

***Bottom right:** IDRC*
CCAA researchers came together in Nairobi, Kenya in 2011 to synthesize the wealth of learning from their various projects by working under the guidance of a group of mentors to produce a special issue of a peer-reviewed journal on climate change adaptation in Africa.

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Acronyms and abbreviations

AAS	African Academy of Science
ABHS	Water Basin Management Agency
ACCFP	African Climate Change Fellowship Program
AMCEN	African Ministerial Conference on the Environment
ARC	Agricultural Research Corporation
CBAA	Community Based Adaptation in Africa (project)
CCAA	Climate Change Adaptation in Africa (program)
CCW	Climate Change and Water (program)
CDP	Community Development Plan
CIFOR	Centre for International Forestry Research
COP	Conference of the Parties (to the UNFCCC)
CORAF	Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles
CSF	Conference Support Fund
DADO	District Agricultural Development Officer
DFID	Department for International Development (UK)
DRC	Democratic Republic of Congo
ECOWAS	Economic Commission of West African States
ENDA-TM	Environnement et Développement du Tiers Monde
FARA	Forum for Agriculture Research in Africa
GDP	Gross Domestic Product
GEF	Global Environment Facility
GFA	Gedarif Farmers' Association (Sudan)
HDLA	High Dam Lake Authority (Egypt)
ICPAC	IGAD Climate Prediction and Application Centre
ICT	Information and Communications Technology
IDID	Initiatives pour un Développement Intégré Durable
IDRC	International Development Research Centre (Canada)
IDS	Institute for Development Studies
IED	Innovation, Environnement, Développement Afrique
IFPRI	International Food Policy Research Institute
IGO	Inter-Governmental Organization
IIED	International Institute for Environment and Development
IK	Indigenous Knowledge
IPCC	Intergovernmental Panel on Climate Change
IRA	Institute of Resource Assessment
IUCN	International Union for Conservation of Nature
IWMI	International Water Management Institute
KMA	Kenyan Meteorological Agency
KSO	Knowledge Sharing Officer

M&E	Monitoring and Evaluation
MOAF	Ministry of Agriculture and Forestry (Sudan)
NAPA	National Adaptation Program of Action
NCG	National Consultative Group
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organization
OM	Outcome Mapping
OSS	Observatory for the Sahara and the Sahel
PAR	Participatory Action Research
PMU	Program Management Unit (CCAA)
PO	Program Officer
R&D	Research and Development
RANET	Radio-Internet
RiU	Research into Use
S&T	Science and Technology
SADC	Southern African Development Community
SINEPAD	Secretariat of the New Partnership for Africa's Development
SMA	Sudan Meteorology Authority
START	Global Change SysTem for Analysis, Research and Training
UNECA	United Nations Economic Commission for Africa
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WaHIP	Water Harvesting Inter-row Planter

Foreword

The International Development Research Centre (IDRC) and the UK Department for International Development (DFID) established the Climate Change Adaptation in Africa (CCAA) program through a donor partnership in 2006. The CCAA governance structure consisted of a Program Management Unit (PMU), an Advisory Board and technical experts. Housed within IDRC, the PMU encompassed program staff, most of whom were based in IDRC's African regional offices in Cairo, Dakar and Nairobi to ensure connections with African stakeholders. A few staff were also based at IDRC headquarters in Ottawa.

The CCAA Advisory Board consisted of African members working for African institutions in the field of climate change adaptation, as well as donor representatives from IDRC and DFID. The Advisory Board was a mechanism for ensuring African guidance on overall program direction, strategy and main priorities.

The CCAA team wrote this report collaboratively, with different members contributing different chapters. The Program Leader took overall responsibility for writing and coordination, and worked closely with the Program Management Officer and Program Officers to ensure accuracy and consistency. The report reflects the different expressions and styles of the multi-disciplinary team members, providing a narrative through which to understand the rich tapestry of CCAA work over the past six years.

Executive Summary

The CCAA Story - What is this report about?

In 2006, the International Development Research Centre (IDRC) and the United Kingdom's Department for International Development (DFID) jointly undertook an ambitious research and capacity-building program on adaptation to climate change in Africa. True, African people are knowledgeable about the realities of climate variability, extremes and change. However, millions of farmers, pastoralists, fishers and livestock producers are vulnerable because they are poorly resourced and have few safety nets and little or no institutional protection. The program, Climate Change Adaptation in Africa (CCAA), was an investment of £25.25 million and 16.25 million CAD respectively representing DFID and IDRC contributions over six years between April 2006 and March 2012.

The program responded to a gap in research capacity and the need to strengthen the knowledge base of African scientists in ways that will benefit the most vulnerable. In doing so, CCAA brought together two concepts fundamental to sustainable climate change adaptation in Africa. The first is an emphasis on African leadership in research on climate change adaptation, particularly to support the most vulnerable communities. The second concept is that adaptation requires different types of knowledge, from different levels, and involving a wide range of stakeholders. CCAA, in producing and relaying knowledge on adaptation, combines different strands of knowledge for greater impact.

CCAA recognized both social and technical aspects of adaptation. Its research provided a vivid account of how biophysical and social factors interact. As much as climate change or other physical processes, it is often poverty – in terms of lack of resources or choices – that creates vulnerability. For example, reduced rainfall is disastrous for farming communities only if they do not have the knowledge or other resources to adapt their livelihood strategies. CCAA projects included the role of social and cultural factors in developing drip irrigation in Morocco, building low-lying earth dams to improve water availability for agriculture in Senegal, developing tools for early prediction of malaria epidemics in Kenya and Uganda, and cultivating drought-resistant crops to protect soil moisture in Benin.

CCAA work tells its own story of the importance of addressing climate change adaptation as a multi-disciplinary theme, and how such a research approach can facilitate connections across several regions in Africa and embrace diverse social groups. CCAA demonstrated how scientists

in different countries are constructing their scientific narrative on climate change adaptation to stimulate locally owned responses to environmental problems. Notably, scientists in CCAA projects worked closely with local communities according to local needs rather than traditional research disciplines. For instance, scientists helped farmers to devise experimental protocols, and conducted surveys to verify some of the perceptions discussed in reflection meetings. In some cases, they conducted modelling to predict future impacts of different climate-change scenarios and proposed adaptation options. In others, they conducted cost-benefit analyses to help farmers choose between different options and to advocate for investments by the state.

CCAA demonstrated the value of participatory action research (PAR) in building ownership and partnerships, and strengthening adaptive capacity. However, the CCAA model of PAR is not a complete and globally applicable approach to solving the adaptation challenges of every community in Africa. The significant transaction costs – and limited numbers of qualified and experienced researchers – would prohibit widespread replication and scaling up. Nonetheless, PAR processes can be adopted and scaled up by civil society and development organizations. Researchers can support these efforts rather than lead them, and conventional state, civil society and development programs will continue to be needed. Nor is PAR a substitute for rigorous scientific enquiry that controls confounding variables to produce replicable, generalizable results. However, traditional scientific enquiry alone is not capable of producing the insights and practical achievements of PAR. Both approaches are necessary in identifying practicable solutions to climate adaptation challenges. PAR approaches can complement other public programs, and can support them.

Another important aspect of the CCAA story is the critical importance of mentoring support provided by the CCAA staff. Success would not have been possible without numerous exchanges between CCAA Program Officers and researchers, and the same process multiplied between these researchers and their own partners in different constituencies. This support relates to the building of confidence, nurturing of skills, development of proposals and engagement with stakeholders.

This report takes stock of CCAAs program strategies and the results obtained. It illustrates the progress and lessons learned – both planned and unplanned – with **examples from 41 research projects, 5 knowledge-sharing projects, and 27 research-support projects**. This report also reflects on how to build adaptive capacity in future through research programs, considers learning on how to run an effective continent-wide initiative, and assesses the contribution and legacy of the CCAA program.

What is the CCAA approach?

Management of the program was housed within IDRC, an organization with over 40 years of experience in research for development. IDRC's corporate 'grants plus' model goes beyond financial support to address engagement with researchers to build capacity and create new opportunities. The program staff was based in IDRC's regional offices in Senegal, Kenya and Egypt, with support from headquarters in Canada. An Advisory Board provided strategic orientation to guide the program's constant need to think strategically on how the project results and activities could collectively influence adaptation in Africa.

- **Participatory Action Research**

The CCAA program was designed to build a strong knowledge base and address inequalities in capacity to adapt to climate change. With a stated focus on the most vulnerable people, a key strategy was to include them in the research process. Participatory action research was selected as the preferred methodology to engage those most vulnerable to climate change in joint learning. As a result, the program has widened adaptation research to include a diversity of organizations in Africa – many of which did not consider adaptation as part of their traditional research agenda. Hence, there are now emerging organizations working on climate change adaptation and using their capacity to leverage new funds in this discipline. For instance, the NGO Initiatives pour un Développement Intégré Durable (IDID) in Benin had done marginal work on adaptation prior to successfully securing a grant from CCAA in 2007. Its newly developed status as a player in adaptation research then led to the Ministry of Environment selecting it to advise on the National Adaptation Program of Action (NAPA). IDID has also attracted new funds for a climate change project from the UNDP. Another example is the Centre de Suivi Ecologique (CSE) in Senegal, which was designated the leading Adaptation National Implementing Entity (NIE) as a result of its extensive research on adaptation under the CCAA program.

- **Flagship Projects – Fellowship Program and AfricaAdapt**

In addition to research, CCAA developed two flagship projects that continued after the CCAA program came to an end. The first one focuses on education and training: a fellowship program with continental reach, the African Climate Change Fellowship Program (ACCFP). The second flagship project is AfricaAdapt, a strong network intended to meet practical needs for sharing knowledge on adaptation.

The ACCFP shows how partnerships are built with key organizations in Africa and beyond. Its goal is to build a strong cadre of African scientists that can work with their governments and people in ways that will build the resilience of farmers, pastoralists, fishers, foresters and women who are increasingly reliant on ecosystem services and goods as their main source of livelihood.

Open to both young scientists and mid-level career professionals, the ACCFP emphasizes the importance of inclusion in a field as broad as adaptation. With different types of fellowship to attract candidates from the spheres of science, academia and policy, fellows build new skills on climate change adaptation and strive to be part of a vibrant network that will collectively form the knowledge base of Africa on emerging issues on climate adaptation. The 45 fellows from the first phase, and 50 fellows from phase two of the program, will use their research findings to catalyse new studies on adaptation and their experience of working with vulnerable groups will also serve the maintenance of a diverse stakeholder constituency.

The CCAA program understood the importance of creating a space – a platform, a knowledge hub – that allows different kinds of knowledge to flow freely in order to address the knowledge needs and demands of various stakeholders. AfricaAdapt, a bilingual, pan-African knowledge sharing network, is becoming an international knowledge sharing platform able to pool constituencies and audiences working on climate adaptation. Using a wide range of tools and activities – including a website with online membership, print, radio and other audio-visual resources, face-to-face networking events and social media tools – AfricaAdapt has attracted more than 1000 registered members, 80% of whom are based in Africa. In addition, AfricaAdapt provides small grants to test new ways of transforming adaptation knowledge into forms that can be used by African communities at risk from climate change.

Understanding the value of knowledge exchange as essential to building resilience, AfricaAdapt is showing great potential in reaching hard-to-reach groups. Working as part of a consortium of four organizations, the program uses its newsletter 'JotoAfrica', 'meet-and-greet' gatherings and a successful Africa-wide symposium to make its mark as an innovative knowledge sharing hub.

- **Research into Use**

Other activities also emphasize the premium that CCAA placed on knowledge sharing as a prerequisite for enabling adaptation. Hence, through a conference fund, the program supported African scientists, policymakers and community representatives to share knowledge on adaptation, and to break the perceived knowledge barriers between some groups of stakeholders. CCAA supported over 44 individuals to attend conferences, and 28 organizations to organize conferences, and also targeted journalists to build their capacity in reporting adaptation stories. Through an initiative to put "Research into Use" (RiU), the program captured lessons about innovations in adaptation projects and maximize the likelihood of CCAA research reaching high-profile influential groups. This initiative produced several policy films as well as a website to highlight the program's key achievements and results, and to increase access to the range of knowledge products generated throughout the CCAA program.

CCAA always included an explicit focus on policy engagement, seeking ways of relaying adaptation innovations and practices to key regional organizations and policy groups across the continent. The program worked with the Southern African Development Community (SADC) as

well as the East African Community (EAC) to help fulfil their need to set up climate change units. These are only two examples of the ways in which the PMU sought to engage policy communities by addressing their knowledge needs and demands.

Research into use is a principle applied throughout the program, to help communities build their resilience to climate shocks and extremes. For example, through CCAA urban vulnerability projects, African researchers used hydrologic models to determine 'vulnerability pockets' in Accra, in order to assess different scenarios and analyse how climate change complicates the management of waste, water supply and flooding. Similarly, the research team working on an urban vulnerability project in Benin was able to put its knowledge into use by protecting the urban area of Cotonou as floods became more frequent.

Why is this report different? Crafting core messages

The main premise of the CCAA strategy was that knowledge attained through research is an essential tool in the fight against vulnerability to climate change. The assumption was that African researchers and communities are best positioned to undertake and interpret such research in Africa. Research is not a static process – it is evolutionary. It involves the co-learning of different stakeholders with potentially divergent interests, but willingness to engage in a process that can offer solutions to the current problems of climate change. The overriding narrative of this report is that adaptation is an experimental process of testing ideas, making changes, and giving African researchers and vulnerable communities the space and confidence to identify new approaches, all inherently bound in a social process. For example, researchers and communities themselves can select crop species that work, and can make strategic decisions and exchange advice on when to plant.

This report explores CCAA's learning on effective approaches for using research to enable adaptation by the most vulnerable. The following **six core messages** encapsulate this learning.

Researchers established new forms of institutions to respond to climate change, such as farmer field schools and learning plots in a project on adaptive capacity of smallholder farmers across Africa.

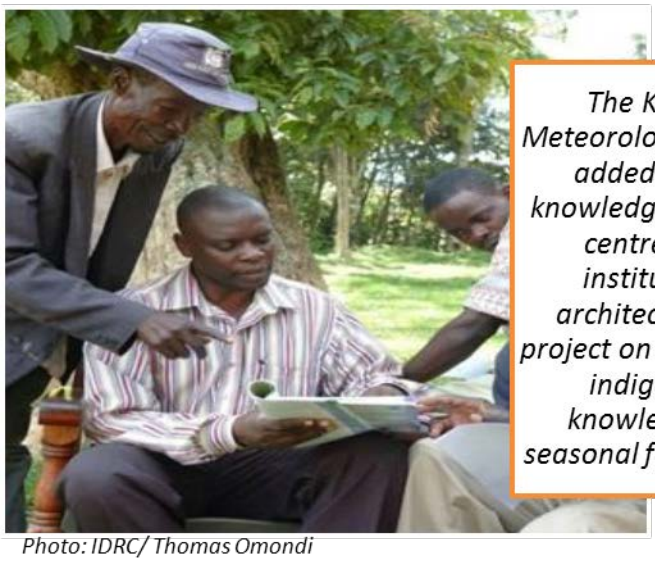
Photo: P. Mapfumo, University of Zimbabwe

1. Strengthening or establishing an institutional framework can support or initiate adaptation

CCAA projects demonstrated the need for effective institutional support that can better enable the uptake of adaptation options and their sustainability. In different regions of Africa, for example,

agricultural systems are becoming less reliable as ecosystems are degraded and the relevant structures in place to support farmers' efforts are often absent.

The social context and its processes are central to adaptation. CCAA researchers sought to activate, both formally and informally, social processes that would give momentum to their adaptation action. They started by diagnosing the problem, setting parameters and establishing mechanisms to frame the issues and validate adaptation options. This approach recognized that viable adaptation processes have to be structured within an institutional architecture: one that is able to incentivize and disseminate adaptation strategies and options.



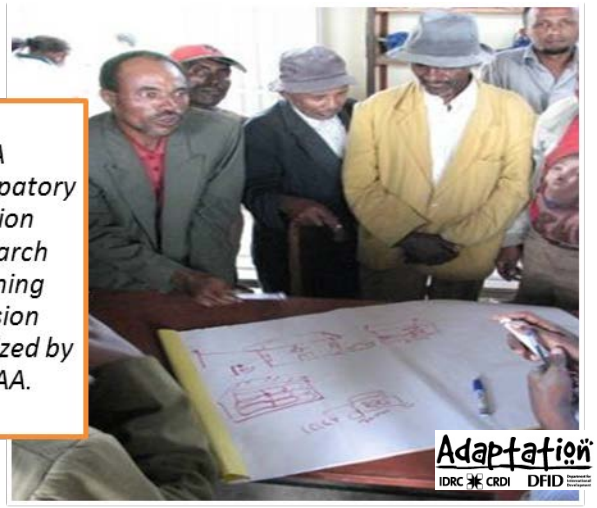
The Kenyan Meteorological Office added a local knowledge resource centre to its institutional architecture in a project on integrating indigenous knowledge for seasonal forecasting.

Photo: IDRC/ Thomas Omondi

In some cases, this involved modifying existing institutions to adapt to the challenges posed by climate change: this was the approach taken by researchers working to integrate scientific and local forecasting techniques to better address the needs of vulnerable communities. In Kenya, this involved working with the Kenyan Meteorological Organization and ultimately resulted in the addition of a local knowledge resource centre to its institutional architecture. In other cases, CCAA enabled new ways for institutions to evolve to respond to climate change. This report shows how— through examples such as the establishment of learning centres and plots, farmer field schools, *cellules du littoral*— CCAA researchers have facilitated some consensus on adaptation and how it can be sustained.

2. Building capacity in interdisciplinary research methods helps to ensure that both social and biophysical aspects of climate change are addressed.

There is a risk that climate change adaptation gets framed exclusively as a biophysical problem, with scientists lacking the capacity to integrate social research methods into their work. As a corollary of the more general lack of research capacity in Africa that catalysed



A participatory action research training session organized by CCAA.

Photo: IDRC

CCAA, the risks of neglecting the social aspects of vulnerability and adaptation on the continent were very real at the outset of the program. CCAA researchers, many of whom have a background in the natural sciences, have demonstrated their increased capacities to address both social and biophysical aspects of vulnerability and adaptation to climate change, recognizing the limits of separating these approaches. For example, in the project on *Urban Adaptation in Cotonou,* CCAA researchers carried out two studies as a part of their initial vulnerability assessment. One focused on changes in the biophysical environment predicted by climate models, while another focused on the social aspects by analysing the effects of land-use planning on vulnerability. When comparing the results, researchers learned that vulnerability to flooding was not only due to biophysical impacts of climate change, but was exacerbated by absent or ineffective land-use laws and regulations. This research result enabled partners to begin developing adaptation strategies that take these social factors into account. The inclusion of the socio-cultural aspect led to practical adaptation innovations.

Photo: IDID-ONG

CCAA researchers also integrated knowledge of biophysical aspects of climate change into the social realm. This was particularly clear in projects on local knowledge. Researchers recognized the need to make scientific knowledge accessible to communities, and that local knowledge is a crucial entry point for achieving this. A recurring example was the development by many CCAA researchers of seasonal forecasts that incorporate both local and scientific knowledge. This was an important task: on the one hand, local forecasting techniques specific to the particular conditions of vulnerable communities are insufficient in the face of rapid fluctuations brought about by climate variability. On the other hand, scientific forecasts often address vast areas of knowledge and are expressed in terms that are not understood by vulnerable communities. The integration of these different knowledge sources benefited the meteorological services by adding richness to forecasts and making them relevant to stakeholders on the ground. It facilitated the uptake of integrated forecasts in communities used to relying exclusively on local knowledge. The approach also led to innovative collaborations that far exceeded the original intent.

3. Fostering a culture of social learning among all stakeholders allows the most vulnerable to frame research that is relevant to their needs.

In Tunisia, focus groups showed that changes in herding patterns would reduce vulnerable women's exposure to leishmaniosis.

Photo: Tunisia's National Observatory for New and Emerging Diseases

CCAA researchers were very creative and successful in putting social processes at the heart of climate change adaptation. Setting up participatory committees such as focus groups – particularly of those most vulnerable to climate change impacts – helped social actors create their own spaces and frame the issues in ways that reflected their interests, stakes and values. For example, through the establishment of women's reflection groups, researchers working on *Health Impacts of Climate Change in Tunisia* discovered that decreasing women's vulnerability to leishmaniosis could be achieved by changing herding patterns, which would reduce their exposure to the disease. Such mechanisms for social participation also constituted an important decision-making stage to help frame, validate and measure adaptation action. CCAA's legacy is not measured in terms of new technologies or sophisticated models, but by its contribution to establishing these spaces for social learning, thereby building confidence in the contributions that vulnerable communities can make, and gradually closing the knowledge gap between researchers and other stakeholders.

4. Brokering networks of partnerships across scales and social actors is necessary to ensure uptake of adaptation strategies.

CCAA partners developed a culture of building coalitions through research as a central part of their overall engagement strategy. Most of them used PAR, an approach that facilitates exchanges between different knowledge holders. PAR is not new, but its use to address adaptation by promoting dialogue and partnerships among researchers and stakeholders is. As one partner put it, noting that in Ethiopia "the farmer makes 30 different kinds of decisions in a single month", farmers can be considered as researchers in the CCAA model.

In Sudan, researchers established an innovation system by developing partnerships among scientists, policy makers, and community members.

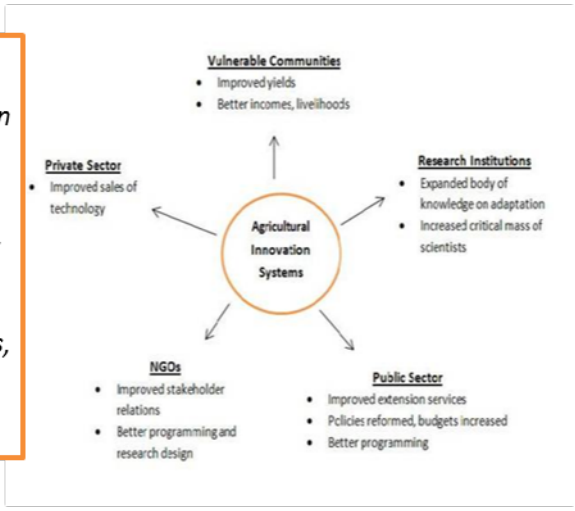


Photo: Evans Kituyi/IDRC

CCAA researchers observed that brokering partnerships across scales and social groups is a key prerequisite for successfully implementing adaptation strategies. This is mainly because knowledge sharing is central to building adaptive learning and creating a space for effective implementation of appropriate responses to climate change. For example, in Sudan, CCAA researchers working on the *Managing Risk in the Horn of Africa* project established an innovation system by developing a set of partnerships among scientific, policy and community stakeholders. At first, the needs of the different stakeholders were in conflict. Among other outcomes, the partnerships that CCAA researchers facilitated led to a consensus, and resulted in the design of a mechanized planter that would meet the adaptive needs of all stakeholders.

5. In adaptation processes, different types of experimentation are necessary to build knowledge and to understand what does and does not work.

CCAA researchers considered the exploratory nature of adaptation. Experimentation was built into the research design of many projects, and taking time to test different types of experimentation was perceived as necessary to understand what worked. In a project on *Agriculture and Food Security in Benin*, CCAA researchers established farmer field schools where farmers and researchers experimented with various farming techniques. This experimentation identified simple, tried-and-tested adaptive strategies that farmers could then implement. For example, the combination of fertilization and new mulching techniques increased corn yields at experimentation sites by up to 78%. In Zimbabwe, while farmers originally did not believe that they could achieve high maize yields on sandy soils, involving them in a

Photo: Paul Mapfumo, University of Zimbabwe

process of experimentation demonstrated that the use of phosphorous fertilization and organic carbon soil management were effective techniques for increasing maize yields. Experimentation also showed that timing of planting was an important factor, with planting maize two weeks earlier in the season improving yields by 60%. Thus, the engagement of stakeholders in processes of experimentation was key to ensuring the uptake and implementation of adaptation options.

6. Integrating adaptation results into policy processes helps ensure uptake and longer-term sustainability.

Researchers working on sea-level rise in northeastern Morocco worked with local policymakers to develop adaptation strategies for two governorates.

Photo: Mary O'Neill/IDRC

For many of the CCAA researchers, results were especially visible when government officials were included in the research teams. CCAA researchers working on sea-level rise in northeastern Morocco, for example, worked with local policymakers to develop adaptation strategies for two governorates. The collaborative process led to the inclusion of the research results within the governorates' official work plans.

Policy is a central factor shaping the livelihoods of the poor. It is especially important to understand how policy conditions affect livelihood opportunities, particularly through policy processes affecting environmental resource management and the building of adaptive capacity. The CCAA strategy for policy inclusion was to consider decision makers as essential to the research process. The principles of PAR seek ways of engaging decision makers in the research enquiry, including them in defining research questions. Therefore, the inclusion of research results in 'opportunistic' policy spaces is integral to the research process. For example, in the project on *Agriculture and Food Security in Benin*, funds from the first round of Canada's Fast Start Climate Finance fund managed by IDRC were used to expand an early warning system that advises two million farmers about impending droughts or floods and proposes measures to safeguard crops. The research team produced evidence that positions them as a reference point for the government of Benin on climate change policy.

These types of inclusive processes encouraged policymakers' cooperation with project teams and created a sense of ownership within the relevant ministry or sector. Because partners have sought such close collaboration within key policy circles, progress has been made towards integrating research as an integral component of adaptation policymaking, and towards breaking down

barriers between research and policy processes. Therefore, the CCAA approach also considerably shortened the accountability and bureaucratic process between the generation of research results and policy attention based on those results.

The field of climate change adaptation can be inaccessible when adopting overly technical language; however, a hallmark of the program was the demonstrated ability of CCAA researchers to speak to the needs of policymakers by establishing policy linkages at the local, national, and regional levels. As one scientist remarked: "I know that in CCAA you love PAR, but believe me in this place we don't even have basic data to help create plans and policies for the state. There is an important role for studies, simple studies, and this is why the policymakers value our work – we give them information that they can use." CCAA's policy efforts will continue following the program's closure through a research-to-policy platform led by the Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles (CORAF). Through this platform, African leadership will sustain and expand upon these policy results and will continue to draw on the cadre of seasoned researchers supported by CCAA.

Identifying opportunities for action – the CCAA contribution

CCAA has changed the landscape of work on adaptation to climate change in Africa. Through its research, knowledge-sharing and capacity-building efforts CCAA has:

- developed new or improved capacity for research through the engagement of 39 African institutions leading CCAA projects, 244 African organizations involved in implementing research, 45 new research scientists trained in a first phase of a now on-going fellowship program
- provided new knowledge through some 500 different products, including approximately 50 peer-reviewed publications, and a special issue of a high-profile journal
- created new awareness and demand for this knowledge through the engagement of 157 policy actors, over 200 media hits, and 85,000 visitors to the CCAA program web pages.

Most of all, CCAA has touched the lives of thousands of farmers, herders and fishing folk across the continent. The need to build resilience and to adapt to a changing climate is as great if not greater now than when CCAA was designed. With African leaders calling for action in this area, as witnessed in Durban during the 17th Conference of Parties (COP17), and increasing attention from the international community, demand for innovative, relevant, and effective adaptation is very high. CCAA was particularly timely in preparing the way for action. This report details how the six core messages outlined in this summary emerged from the story of the context that incited CCAA, the strategy the program formulated in response, and the program's culminating results and future directions.

Section 1 – Introduction

1.1 Context for the creation of the Climate Change Adaptation in Africa program

The Climate Change Adaptation in Africa (CCAA) program was launched in 2006 as a research and capacity-development program to improve the capacity of African people and organizations to adapt to climate change in ways that would benefit the most vulnerable. The program sought to build on existing initiatives and experiences to establish a self-sustaining body of expertise in Africa.

In 2006, it was clear that the impacts of climate change and variability were already greatly affecting Africa, but that the continent possessed the least capacity to adapt. It was observed then, as it is now, that the rate, pace and severity of change and frequency of extreme events such as droughts, storms, floods and heat waves, as well as shifting rainfall patterns, affects the livelihoods of farmers, herders, fishers, forest-dependent people and urban dwellers, and exacerbates food insecurity and poverty. African populations remain particularly vulnerable to extreme weather events because of widespread poverty, fragile ecosystems, weak institutions and inadequate knowledge on how to tackle climate hazards.

The launch of CCAA also preceded the launch of the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (IPCC, 2007). With this came the observation that African scientists lacked capacity to lead the adaptation research agenda and, given the continent's increasing vulnerability to climate change, more needed to be done to boost research capacity in adaptation. The overall sentiment was that this lack of capacity tended to further weaken the continent's ability to prepare for adverse impacts of climate change.

In addition, Africa's policymakers and practitioners lacked guidance on viable adaptation and mitigation options, and on options for minimizing current threats. Although the UN Framework Convention on Climate Change (UNFCCC) did recognize both adaptation and mitigation as necessary response strategies, mitigation strategies gained more prominence in climate change debates and UNFCCC negotiations. Policy and institutional processes at the time gave little attention to adaptation, despite studies that warned of increasing trends in the warming patterns associated with historical emissions. Later, at the 8th Conference of Parties (COP8) to the UNFCCC in Delhi, adaptation slowly emerged as an agenda item in its own right.

When CCAA was being planned, there was growing international focus on Africa's development issues in general and climate change in particular. For instance in 2004, Tony Blair, former UK Prime Minister, highlighted climate change and poverty in Africa as the two

most pressing world priorities. He argued that climate change impacts would offset many hard-won development gains, as well as severely disrupting the livelihoods of resource-dependent communities. He also drew attention to the lack of analysis—within both research and development—of the impacts and potential adaptation options related to climate change in Africa. This clearly articulated the rationale for more research. Similarly, in 2005 at the Gleneagles Summit in Scotland, both climate change and Africa were firmly on the agenda, as world leaders agreed to double aid to Africa. The 2005 report to the UN Secretary-General of the UN Millennium Project added an important foundation for the development of interventions in response to climate change and variability.

Therefore, there were limited new proposals for adaptation strategies from international policy processes and the African research and development community, coupled with robust findings from IPCC that extreme climatic events would become more frequent, more severe and more widespread. This led to concern about the likely increase in marginalization and vulnerability of communities in many parts of Africa. It was thought that the immediacy of climate change and its adverse impacts on vulnerable groups would perhaps provide a new momentum for the continent to "do development differently".

1.2 How climate change affects different resources, environments and sectors

As increasing global temperatures destabilize the dynamics of environmental systems, Africa is experiencing greater climatic variability. Increasing observational evidence shows a tendency for heightened extremes such as heat waves, storms and droughts, combined with gradual changes in annual rainfall, with some wet areas becoming wetter and dry areas becoming drier. These changes have individual and collective impacts on, and implications for, key resources and sectors in Africa. Here, we look briefly at agriculture, urban vulnerability, water and human health.

Agriculture

Agriculture constitutes the single largest economic activity on the African continent. Agriculture and services derived from natural resources support livelihoods of over 70% of people in sub-Saharan Africa, and represent 50% of Gross Domestic Product (GDP) and 40% of export earnings. Despite this, African agriculture has the slowest productivity growth rate in the world, and Africa is the only world region with a declining rate of food production per capita. Climate change poses distinct and significant threats to this crucial yet under-performing sector, undermining both food security and earnings from key export crops.

Since agricultural productivity depends largely on regimes of temperature and water, climatic variations and changes have profound implications. Modelling studies have shown that higher temperatures will significantly reduce yields of crops and staple foods. For example, maize production is projected to fall by up to 10% by 2050 (Akpalu, Hassan and Ringler, 2009). Changes in temperature, hydrology and agricultural practices are leading to desertification in

some areas and increasing soil salinity in others. Rising sea levels are also driving soil salinization in coastal areas, further reducing agricultural productivity.

Changing patterns of rainfall pose considerable challenges to farmers, particularly as 95% of African agriculture is rain-fed. One common pattern is that the total quantity of rainfall over the year is not changing radically, but that rain is falling in more concentrated and intense periods. This intensification exacerbates soil erosion and flooding, and reduces recharge of soils and aquifers. In addition, increasing variability makes weather prediction less reliable, leaving farmers unable to make reliable planting and harvesting decisions. Vulnerabilities in agricultural systems heighten the impacts of these kinds of weather perturbations, leading to reduced food security and increasingly fragile rural livelihoods.

Urban vulnerability

African cities face the challenges of poverty and insufficient infrastructure, as well as poor planning and enforcement. Heavily centralized policies and limited resources, as well as increased in-migration, all reduce the capacity of local municipalities, most of which operate on inadequate budgets. According to UN-HABITAT (2006), 70% of the urban dwellers in many sub-Saharan African countries live in slums. Inevitably, such slums most frequently develop on undesirable land, often prone to flooding. They lack proper sanitation and water distribution, increasing health-related risks. **Most of the human cost of extreme weather in urban Africa does not result from the weather events themselves, but from inadequate protection for residents, compounded by poverty.**

Many of Africa's largest cities, such as Lagos, Alexandria, Abidjan and Cape Town, are located on fragile coasts or river deltas. Populations there are highly vulnerable to rising sea levels, flooding and other extreme weather events, as well as coastal erosion and increasing salt levels in coastal water tables. Loss of wetlands, dunes and other natural protection due to urban encroachment is increasing human vulnerabilities. Economic, social and political infrastructure in many African countries is concentrated in coastal areas, magnifying the importance of protecting these sites and vital resources.

Water

Water is a key resource in the agriculture, urban and energy sectors, as well as being crucial to human health. Water supply, quality and availability remain one of the most pressing and complex environmental and development concerns in Africa. In addition, access to clean water in Africa is extremely variable and is further threatened by climate perturbations.

Many countries in Africa share transboundary rivers. The uncertainties of climate change pose a further challenge to transboundary water-management institutions in avoiding and reducing water conflicts. Climate-driven changes in water availability synergize with changing demographic and economic needs for water. Water demands are increasing due to a growing and urbanizing population, changing industrial uses, and demands for hydropower as a relatively

cheap source of energy. **Any impacts of climate change on the quality or quantity of water will have cascading effects on human development in Africa.**

Human health

Changing patterns of temperature and rainfall also have direct and indirect effects on human health. Increasing numbers and intensities of heat waves have been linked to increased illness, especially in populations without access to cooling technologies. Heat waves exacerbate the effects of respiratory illnesses and cardiovascular diseases, and contribute to serious bacterial food poisoning. Temperature increases are favouring the breeding of vectors and microbes responsible for many diseases affecting African populations. Malaria already accounts for 20% of all child mortality in Africa and, possibly in combination with other factors, higher temperatures have been associated with increased ranges and transmission in Kenya and the East African highlands (UNICEF, 2004). Changing patterns of temperature and rainfall also affect the distribution of many other vector-borne diseases, including leishmaniasis, schistosomiasis and onchocerciasis.

Diarrhoeal diseases, including outbreaks of cholera, are often seasonal, and affected by both water quality and temperature. Water quality is strongly related to water quantity, since reduced water supplies leave people reliant on unclean sources. Excess water creates problems also, because stagnant water left by floods and intense rainfall are breeding grounds for mosquitoes that transmit dengue fever and malaria.

Climate change is also heightening food and water insecurities. The World Health Organization (WHO) describes malnutrition as one of the largest health crises in the world – with 800 million people worldwide classed as malnourished, half of which are in Africa. Malnutrition weakens the ability of human immune systems to fight infections and disease. In African countries where public health systems and institutions are weak, further stresses on health systems will exacerbate the vulnerabilities of poorer communities.

1.3 The challenges for adaptation in Africa: CCAA's aims

The international community has organized a number of funds to support adaptation in developing countries, in addition to development aid. However, effective adaptation requires African countries to have the knowledge and institutions to develop appropriate policies, and to absorb and direct funds allocated to adaptation initiatives (Barr et al., 2010). Consultations that preceded the design of the CCAA program indicated important gaps in both knowledge and institutional capacity in Africa. Indeed, many of the consulted organizations lacked both personnel with qualifications for climate-related research, as well as linkages to knowledge databases and other institutions locally and abroad that would allow them to exploit synergies for research (Nyong, 2006). Many organizations were underfunded by their governments and did not prioritize climate change. These gaps seriously compromised African countries' capacity to take advantage of imminent funding opportunities.

There have been important technological advances in climate prediction, crop varieties, agricultural water management, and protection against flooding and sea-level rise. However, Africa's institutional arrangements prevent the poorest and most vulnerable from benefiting. These institutional deficits are notable in areas such as credit, insurance, the dissemination of weather and seasonal predictions, rural extension services, and other technical assistance. There is also a major disconnect among researchers, policymakers and development practitioners in much of the continent; few options are developed from local context studies, and there is no critical mass of experts at various levels of academic qualification and training in adaptation management.

On the other hand, **vulnerable groups have already developed a large number of adaptation strategies on their own.** Most of these remain largely undocumented and vary across communities, regions and cultures. Researchers and policymakers are often unaware of these strategies and of the different ways in which they could support local adaptation.

When CCAA was designed, it appeared urgent to support a research process in which researchers, vulnerable groups, policymakers and development players were jointly involved in examining present and possible future climate impacts and in testing together a number of institutional arrangements and adaptation options, both technical and endogenous. The main premise was that promising adaptation options and institutional arrangements could inspire communities across Africa— and development as well as national adaptation programs. Moreover, it was also anticipated that a process for joint reflection and planning adaptation strategies could be tested, refined and promoted.

1.4 The logic of CCAA: strengthening the capacity of African people and organizations

The program design identified **four specific objectives for achieving the overarching goal of improving the capacity of African people and organizations to adapt to climate change to benefit the most vulnerable.** These objectives were to:

- strengthen the capacity of African scientists, organizations, decision makers and others to contribute to adaptation to climate change
- generate a better shared understanding of the findings of scientists and research institutes on climate variability and change
- support adaptation by rural and urban people, particularly the most vulnerable, through action research
- inform policy processes with good-quality, science-based knowledge.

CCAA was, therefore, specifically designed to stimulate a market in knowledge on adaptation, creating supply from research and demand from policymakers, as well as helping to address capacity and institutional deficits. **To achieve its objectives, the CCAA program specified three complementary activity areas or strategies,** giving space to continuous experiential

learning and improvement. The three strategies (with activities described in detail in Subsections 2.1–2.3 below this report) were:

1. **Support for Participatory Action Research**
   The program aimed to support Participatory Action Research (PAR) through grants to African organizations to implement research through partnerships among a wide range of institutions. A phased call for proposals was used to allow for learning in each new phase.
2. **Education and training**
   The CCAA program supported a range of activities designed to strengthen capacities of individuals through innovative approaches including: allowing researchers to embed and, jointly with universities, supervise MSc and PhD candidates in their research projects; a fellowship program on climate change; and convening capacity-building workshops to strengthen skills and improve knowledge of project partners in areas that would be identified during research implementation.
3. **Communication and networking**
   To complement the knowledge sharing within projects through PAR, CCAA supported activities to allow sharing research findings with other projects, the scientific community and the wider public, to inform program and donor directions and to support the sharing of knowledge among the poor.

The CCAA program logical framework identified four outcome areas related to the four objectives. These formed the benchmark for all evaluations and for the monitoring of project progress. Specific indicators were developed and improved over the life of the project to reflect learning. **The four outcome areas** were:

1. Research teams are better able to assess climate-related vulnerabilities and to evaluate and develop adaptation options.
2. At-risk groups, policymakers and researchers share learning and expertise on climate vulnerability and poverty.
3. The poor in rural and urban environments apply their experience of adaptation with the knowledge and technologies generated by research to implement improved and effective adaptation.
4. Policy processes are informed by good-quality, science-based work on vulnerability and adaptation, and by the experiences of the rural and urban poor.

In addition to producing these outcomes as improved capacities among and exchanges between researchers, policymakers and vulnerable groups**, the program and its partners generated valuable knowledge on processes of joint learning.** CCAA teams used and refined approaches for engaging stakeholders in exploring possible future climate, discussing and testing adaptation options, and exchanging perspectives. This, together with knowledge about how specific

adaptation options or institutional arrangements can reduce the vulnerability of local groups, can directly inform future adaptation and development programs.

1.5 Organization of the report

Section 2 of this report elaborates the program's strategy and activities for addressing the needs and objectives described above. Section 3 presents the outcomes observed for each outcome area, illustrating them with examples from CCAA-supported projects. Section 4 concludes and reflects on the program's contributions to building knowledge in adaptation. It also discusses the limitations of participatory action research, emerging knowledge needs, remaining challenges and ways forward.

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Section 2 – Climate Change Adaptation in Africa program strategies

In its first year, the Climate Change Adaptation in Africa (CCAA) program developed a demand-driven programming strategy. Given the challenges described in Section 1, and based on initial consultations, the CCAA Program Management Unit (PMU) commissioned a set of scoping studies on the key players in adaptation research. The main aim of these studies was to consider how to significantly improve the capacity of African people and organizations to adapt to climate change in ways that benefit the most vulnerable.

CCAA's three strategies (detailed in Subsection 1.4) were mutually reinforcing. All CCAA-supported research projects included capacity development and knowledge sharing, but the PMU added further layers to ensure a wider base of capacity and knowledge sharing, institutionalized in a way that ensured connections and synergy among CCAA research partners and the various regions of Africa. Equally important was supporting research that was African-led, relevant and translated into appropriate policies and actions. The principle of devolution was a core part of CCAA strategy. With a discerning Advisory Board, the PMU focused on activities to encourage incremental devolution.

This section elaborates on the CCAA approach to each of these three strategic areas, and then considers strategies for the legacy of the program. Later sections delve into the outcomes achieved through implementation of the CCAA strategy.

2.1 Support for participatory action research

From the launch of the CCAA program, donors and advisers emphasized the choice of participatory action research (PAR) as the preferred research methodology to fulfil CCAA's ambitious vision of enhancing African adaptation in ways that had the highest probability of benefitting the most vulnerable. **PAR enables a process of active co-experimentation involving both researchers and potential research users.** In this case, this included policymakers, development practitioners and, when applied at a local scale, communities at risk from the effects of climate change. PAR here is also defined as contributing to the scientific basis of knowledge and to research capacity in Africa by engaging researchers and research users in this collaborative process of learning by doing (Lewin, 1946; Lavoie et al., 2005).[1]

Within CCAA, PAR also allowed for scientific validation and strengthening of indigenous knowledge of climate change adaptation. Local coping strategies in response to climate variability and change were tested in experimental settings, responding to priorities identified by participating stakeholders. The emphasis was on the practical application of research,

[1] CCAA's definition of PAR was also set out in its internal 2007 Program Strategy Document.

recognizing that the approach demanded multi-disciplinary working and involvement of atypical "researchers" such as policymakers and community representatives. As discussed in the rest of this subsection, CCAA supported PAR by providing both funding and training in the methodology.

Funding for PAR projects

The first CCAA call for proposals was intentionally broad in order to gauge the existing research interests and level of capacity of African research organizations on climate change adaptation. CCAA received 281 research proposals, most of which dealt with agriculture and rural livelihoods, or more broadly with environment and natural resource management. Following a rigorous selection process, CCAA funded 10 of these proposed activities as the program's first projects in fiscal year 2006/07.

A gap analysis of the results of the first call, undertaken by the CCAA PMU, informed both subsequent calls for proposals and plans for future training workshops to address perceived capacity gaps. In terms of regional distribution, North and Central Africa were clearly under-represented.

The CCAA strategy document, developed further after the first call for proposals, identified five priority themes, considering sectors of greatest vulnerability in Africa. Four of these corresponded to the climate-sensitive sectors identified in Section 1 above: agriculture and rural livelihoods, urban disaster prevention and management (and coastal-zone management), water management, and health. These topics served as the thematic base for the CCAA research portfolio, supported in later calls and proposal development. The fifth original theme was energy, where the PMU found there was insufficient expressed research interest.

Following approval of the first 10 projects, an additional 13 research allocations made in 2007/08 sought to redress geographic and thematic imbalances, while maintaining a focus on quality research. These additional projects were selected from the first pool of proposals.

One new investment was an "umbrella" fund[2] created by CCAA and the International Development Research Centre (IDRC) Ecohealth program to support projects focused on the connections between water, health and climate change, in West and North Africa. The program's first project in Central Africa, focusing on the forests of the Congo Basin, was also approved in this round.

In 2008, midway through its original five-year mandate, CCAA issued its final call for proposals, focusing on urban vulnerabilities in Africa. Eight projects were approved, further diversifying the program's portfolio, both thematically and geographically. Two new projects involved small island states, including one in lusophone Africa (in Cape Verde and Sao-Tome-and-Principe).

[2] Six projects on Water, Health and Climate Change were supported through this fund.

Given that many of Africa's cities are coastal, a number of the research projects resulting from this urban call addressed related issues.

With this final set of additional projects, **the CCAA program achieved its goal of supporting research across Africa**, addressing adaptation in five of its six original priority areas: agriculture and rural livelihoods, water resources, health, urban development, and coastal resources. Box 2.1 shows the final thematic and geographic distribution of CCAA's projects, and Annex 1-2 lists all CCAA projects.

Although the PMU recognized a need to grow research capacity in the emerging area of climate change economics, this theme was new in adaptation research and would have necessitated thorough training and perhaps experimentation to allow African scientists to familiarize themselves with the concepts and test some research assumptions. With hindsight, perhaps deepening understanding on climate change economics could have allowed scientists not traditionally trained in natural sciences to engage in research on climate change.

Training in PAR methodology

The governance structure of CCAA helped in identifying key program gaps. Indeed, the CCAA Advisory Board argued that if PAR was going to be the principal methodology of the program, it needed to guide CCAA partners in using the methodology in the context of adaptation research. PAR, it was argued, could not be taught within a five-day training workshop. CCAA partners needed to understand practical realities of PAR, which called for more intensive training in both the conceptual underpinnings of PAR and its practical application. These arguments from the Board corresponded with observations from the PMU. Through its early interactions with CCAA's research partners, the PMU highlighted the limited experience of many partners in applying PAR methods.

Further, there were significant variations in how CCAA partners used and understood PAR. Indeed, the program was among the first to apply this methodology to climate change adaptation in Africa on a wide scale. CCAA funded the project *Promoting PAR*, led by the Centre for International Forestry Research (CIFOR). The project provided in-field mentoring visits to CCAA-supported research teams, distance mentoring, as well as a final synthesis workshop. CCAA research partners were encouraged to take advantage of the additional mentoring support provided through the project.

Now that the CCAA program is over, **the results of this investment in PAR as well as other training activities are evident in the high quality of papers, case studies and presentations by research partners that have come out of it**. Providing space to train CCAA partners on PAR methodology was also a planned element of the program's reinforcement strategy, aiming to ensure that partners gained a wide range of skills to increase their research capacity.

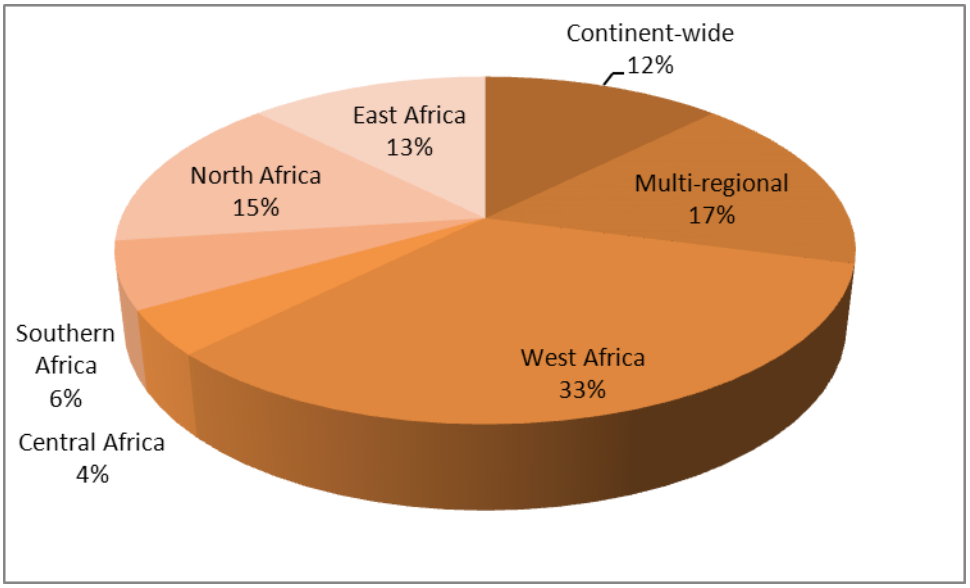
2.2 Education and training

CCAA's original capacity-building strategy aimed to strengthen not only selected research partners, but a wider base of potential adaptation actors in Africa. This wider group included organizations that had expressed interest in carrying out adaptation research, even if they had not been initially funded by CCAA. Through fellowships, a range of demand-responsive capacity-building activities, and supporting the training of graduate students through PAR projects, the program also aimed to stimulate awareness of and capacity for climate change adaptation across a broad range of African policy and academic institutions.

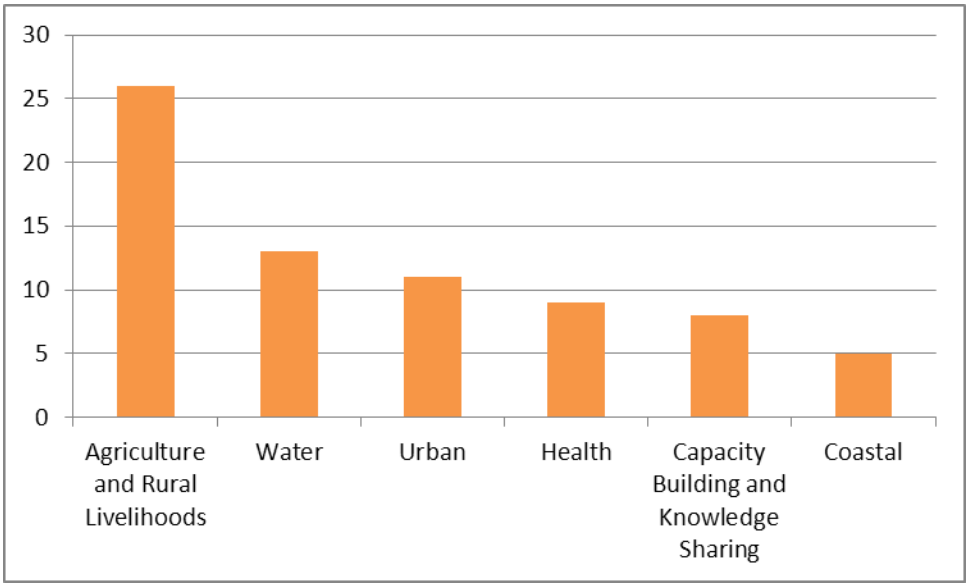
Box 2.1: CCAA research projects by theme and region

- In total, the CCAA program funded **41** participatory action research projects in **33** African countries. It also supported an additional **5** capacity-building or knowledge-sharing projects to support research partners either regionally, or continent-wide. Two of these – the African Climate Change Fellowship Program (ACCFP) and *AfricaAdapt* –received second-phase funding.
- **87%** of the **244** organizations involved in the implementation of CCAA projects were African.
- **39** of **44** institutions that led CCAA projects were African.

Projects by region



Projects by theme



Note: Total exceeds the 41 research projects supported by CCAA as a number of projects touched on two or more themes.

The program's capacity-building plan aimed to:

- assist in developing good-quality proposals in climate change adaptation
- strengthen the knowledge base and research capacity of African institutions and researchers in anticipating, managing and analysing vulnerability associated with climate change and variability, as well as developing appropriate adaptation strategies
- enhance awareness of climate change among specialists and non-specialists working in environmental or broad ministries
- build a rich cadre of African researchers able to analyse, assess and integrate climate adaptation issues into long-term strategic development planning, and thus expand a diverse community of adaptation practitioners
- build expertise in different aspects of climate science and to promote local experiences and home-grown solutions (or locally shared experiences).

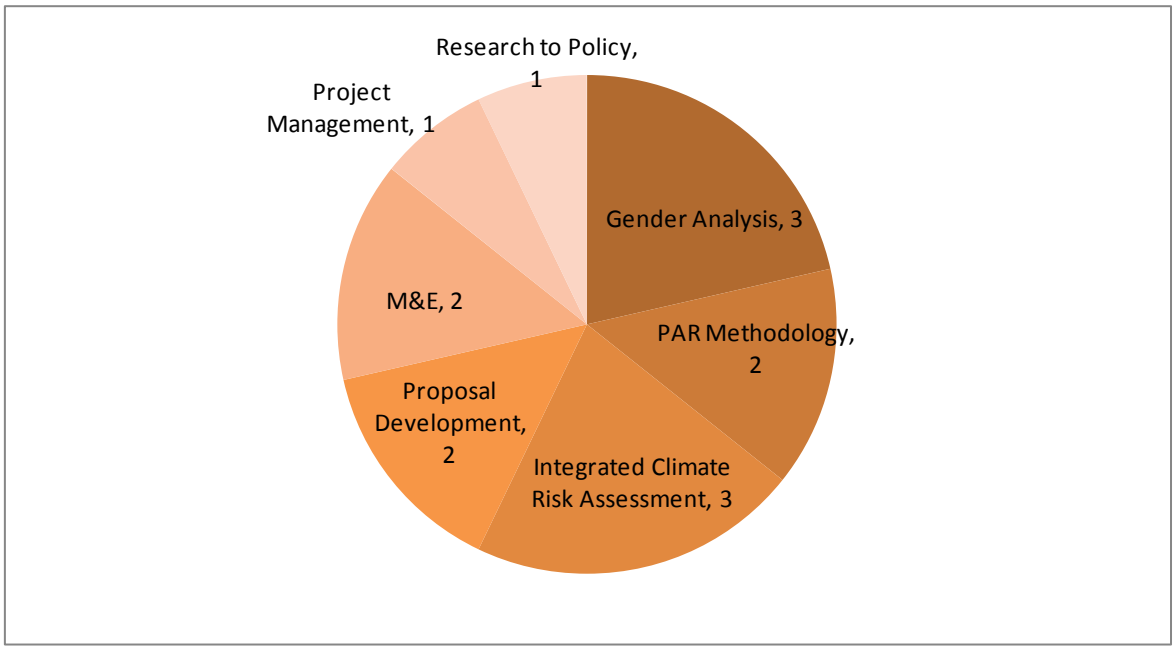
CCAA recruitment prioritized regional training organizations and focused on a train-the-trainer approach to contribute to a strong cadre of African training organizations capable of addressing climate change adaptation. In some cases, the PMU involved researchers themselves in the training, further building their confidence in passing on their knowledge and skills.

Training workshops

The capacity-building training workshops were designed to address knowledge gaps identified from responses to the first call for proposals. The PMU held training workshops on the following topics related to climate change adaptation: integrated climate risk assessment, gender analysis, monitoring and evaluation, participatory action research, proposal development, research-to-policy linkages, and project management. Figure 2.1 shows the proportions of topics addressed by the 14 workshops held by CCAA, and Annex 2-3 provides a full list of the workshops supported.

Seven projects received additional support through the mentoring process steered by CIFOR. This PAR training was decisive in how teams committed their partners and led the research process. CCAA's training workshops were held in both French and English, which contributed to reducing the long-standing separation between the scientific communities in francophone North and West Africa, and in anglophone East and Southern Africa.

Figure 2.1: CCAA program workshops by topic



Demonstrating the flexibility and responsiveness of the CCAA capacity-building strategy, the program also hosted two workshops in response to specific requests. One of these was from the African Development Bank, for training to strengthen staff capacity in climate-risk assessment. The second workshop was on Portuguese-language proposal development, specifically designed to enhance the potential for successful project proposals from lusophone Africa. These requests were seen as opportunities to enable CCAA to address knowledge needs of key organizations, and to forge links with strategic organizations such as the African Development Bank.

The training workshops provided space for African scientists to rethink certain concepts and to deepen their understanding of applications. Seasoned African scientists took leading roles in delivering much of the training.

Fellowships

The CCAA training courses were intended to build a critical mass of African scientists able to help their governments anticipate and plan for climate-related risks. In 2007, CCAA approved funding for the ACCFP, a suite of fellowships to support early-/mid-career African professionals and researchers in pursuing advanced studies related to climate change and adaptation. ACCFP aims to increase both research and institutional capacity in Africa to address the expected impacts of climate change.

The ACCFP, now in its second phase, is a unique program for Africa. It seeks to create an actively engaged community of individuals and institutions dedicated to building scientific capacity to respond to climate change throughout the continent. **ACCFP uses a twinning strategy, bringing African and Northern-based research institutions together to work on**

specific areas of adaptation research. These partnerships were productive in helping African organizations to grow their capacity organically. The process was also enriching for the Northern-based organizations, which were able to test some of their research assumptions and assist African partners in gaining managerial and organizational development skills. In addition, the collaboration between pairs of organizations ensures a two-way flow in building capacity.

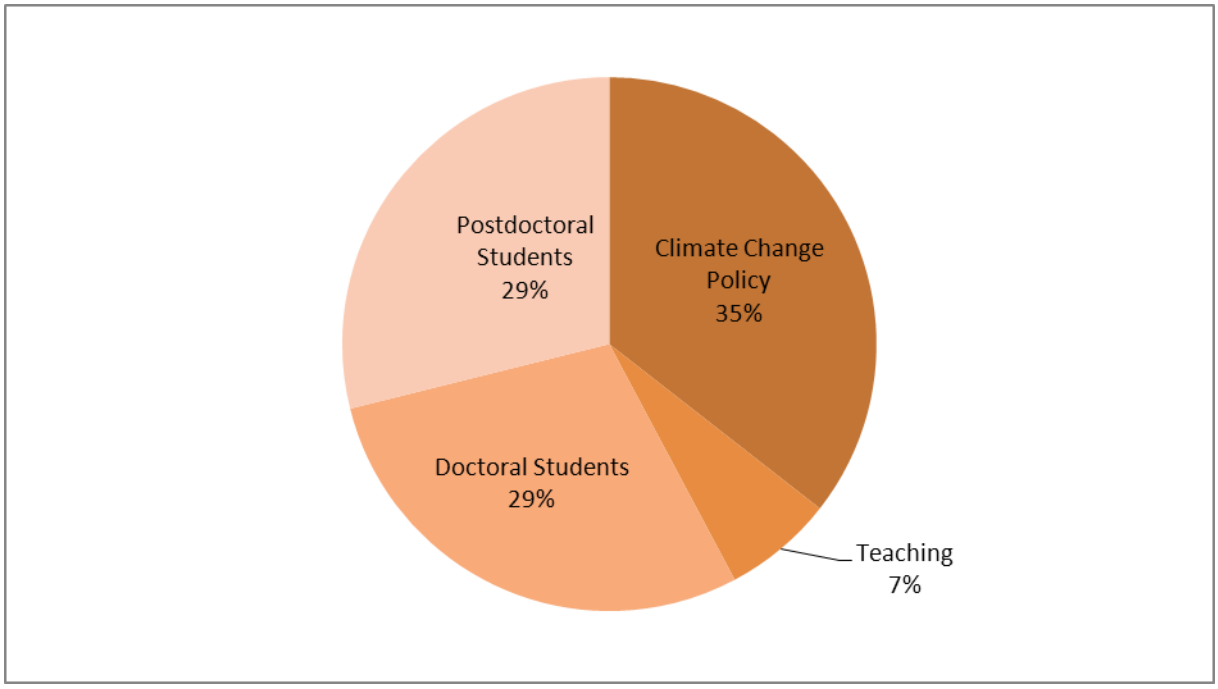
The PMU was aware of the chequered history of capacity building in Africa, but these CCAA partnerships proved very useful overall in enabling the program to carry forward its activities in generating and sharing knowledge. Again taking a twinning approach, during its first phase, ACCFP was led by Washington-based START (the global change SysTem for Analysis, Research and Training) in partnership with the Institute of Resource Assessment (IRA) of the University of Dar es Salaam, and the African Academy of Sciences (AAS). This first phase of the ACCFP had two main objectives:

1. to build institutional capacity within IRA and AAS in line with plans to devolve leadership of project management activities to African institutions in a planned second phase
2. to develop and strengthen a network among institutions with the potential to provide learning opportunities for young African scientists and professionals.

The ACCFP targets not only researchers, scientists and academics but also professionals responsible for decision making and management of climate-sensitive resources. Strengthening and sustaining these human and institutional networks is key to the legacy of the program. Of the 281 registered candidates at the beginning of Phase 1, 45 recipients were finally retained by the Program Executive Committee selection in which a panel of climate change experts and the host institutions took part (see Annex 2-1 for statistics on the ACCFP and Annex 2-5 for profiles of current fellows and alumni). As illustrated in Figure 2.2, the 45 Fellows from 18 African countries selected in Phase 1 of ACCFP focused on:

- policy aspects, aimed at supporting and increasing the analytical capacity of practitioners working on climate-related matters in governments or non-governmental organizations
- teaching, addressing education and curriculum development in institutions that already offered climate change programs
- doctoral studies, for African-university-registered students who have already finished data collection
- post-doctoral studies, allowing young African doctoral Fellows to pursue research under the supervision of an experienced mentor.

Figure 2.2: ACCFP (Phase 1) Fellows by type



The fellowship program featured a variety of capacity-building activities. These included: mentoring by university professors and other experts; sharing experience and knowledge through learning platforms; participation in conferences, notably climate change Conferences of Parties (COPs); developing scientific writing skills, and following through to provide support in publication of findings.

Consistent with CCAA's focus on devolution, funding for Phase 2 of ACCFP was granted in 2010, under the leadership of the IRA. During this second phase, ACCFP will refine and implement the strategy for devolution, enabling full African ownership of the program (as described below in Subsection 2.4). This second round of funding will also support two additional rounds of fellowships, with approximately 50 Fellows expected to receive research awards over two years. **Building this network of scientists will considerably strengthen research capacity** and enable the program through its partners to generate and share knowledge on adaptation.

Training graduate students through PAR projects

CCAA also promoted higher education to create a new generation of young African climate scientists by encouraging research partners to embed graduate students in the funded PAR projects. This both reduced project spending on consultants, and helped to offset inadequate funding for graduate studies in African universities. Key stakeholders were professors from local

universities who supervised these students as well as other professionals and scientists from national agricultural research centres.

In addition to graduating with MSc degrees, many of the students co-authored articles in leading peer-reviewed scientific journals as a result of their work with the PAR project teams. Through the *Managing Risk in the Horn of Africa* project, for example, five MSc degrees were awarded by universities in Tanzania and Sudan, while two PhD candidates advanced to the final stages of their studies. The project *Adaptive Capacity of Smallholder Farmers across Africa* also supported postgraduate research with a particular focus on women. Among the seven theses produced, three were undertaken by women. By the end of 2011, graduate students had completed 47 theses through participation in CCAA research projects.

2.3 Communications and networking

Communications, networking and knowledge sharing activities were the third strategy integral to meeting CCAA's core objectives, particularly those on shared learning and informing policies.[3] CCAA supported communications efforts at both project and program levels. Research partners applied a range of communications practices – from participatory monitoring and evaluation, and stakeholder-engagement meetings to press briefings and developing presentations and briefs for policymakers and other research users. Further examples of project-level knowledge sharing are included in Section 3 of this report, presenting CCAA's results.

At the program level, the PMU developed project profiles and briefs, pitched research stories to journalists, published five annual reports and organized dozens of roundtables and regional and international outreach events targeting government officials, the media, adaptation donors, researchers and development practitioners.

The PMU also catalysed project-level partnerships for brokering two knowledge-sharing forums on topics identified by Program Officers: experiences in access and use of seasonal climate forecasts (Nairobi), and the impact of PAR projects on poverty reduction (Dakar). These forums proved to be an important platform for facilitating project-level partnerships and brokering knowledge among partners from various parts of Africa on what works and what doesn't, around the topics of interest. For instance, the projects *Integrating Indigenous Knowledge in Kenya* and *Managing Risk in the Horn of Africa* revealed the significance and prevalence of indigenous knowledge (IK) in seasonal climate forecasting for planning farm operations in a wide range of African countries.

Partners also shared lessons from East Africa on what made IK forecasters acceptable in policy realms, and on how to integrate these forecasts with scientific options from meteorological departments. These findings on the critical role of IK in development, and the subsequent recommendation for their policy recognition by African governments, served to strengthen the PMU's communiqué to the regional negotiations for a Common African Position to COP 17 of

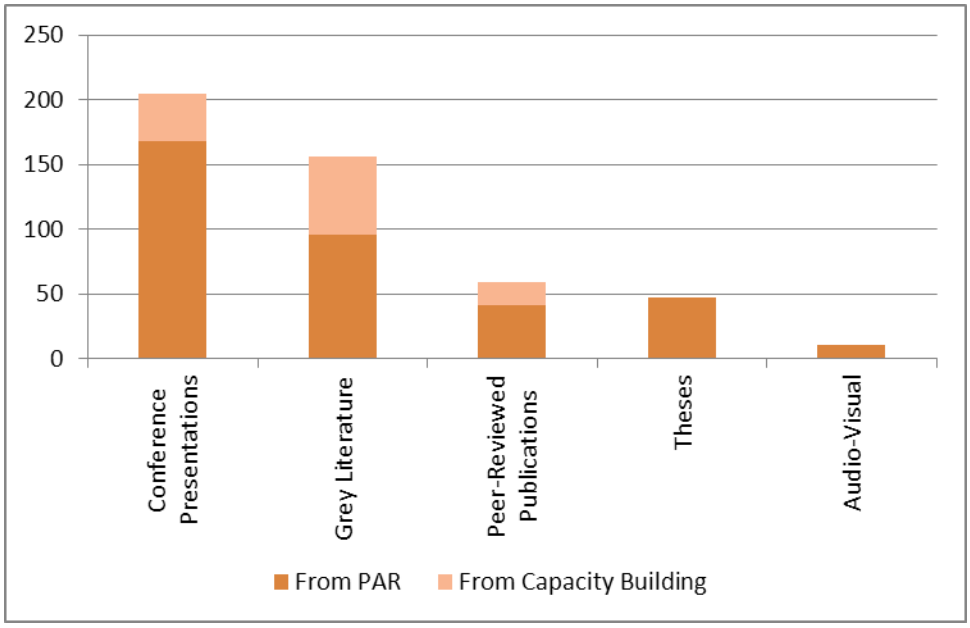
[3] Detailed further in the CCAA *Knowledge Sharing Framework*, an internal document (August 2007).

the UNFCCC. These findings have since made their way into the African Ministerial Conference on the Environment (AMCEN) Decision on Climate Change, adopted in Bamako in September 2011.

Project-level knowledge sharing

During the design and development of CCAA project proposals, partners integrated communication strategies for the production and dissemination of project outputs. Figure 2.3 illustrates the types of outputs produced, for a total of nearly 500 outputs by the end of the program. Outputs included vernacular radio programming and radio drama, field days, and multi-stakeholder reflection groups. Partners also recognized the importance of Information and Communication Technologies (ICTs) for effective knowledge sharing. Many projects developed websites featuring project outputs and links to other projects and programs.

Figure 2.3: CCAA project outputs, by type



AfricaAdapt knowledge-sharing platform

The *AfricaAdapt* network, like the ACCFP, was born of a project that linked a strong Northern institution with three African organizations with complementary strengths, with the intention of devolving capacity and leadership to Africa. The UK-based Institute of Development Studies (IDS) partnered with ENDA-Tiers Monde, an international NGO based in Senegal; the Forum for Agricultural Research in Africa (FARA), a pan-African agricultural research organization with its secretariat in Ghana; and the IGAD Climate Predictions and Applications Centre (ICPAC), a leading climate-information organization based in Kenya. Building on the lessons of a first three-year phase of applied research on knowledge sharing, the CCAA program in 2010 approved Phase-2 funding for *AfricaAdapt*, now led by the Dakar-based ENDA-Tiers Monde.

The network's first phase provided a starting point for a bilingual, pan-African model of knowledge sharing. A range of tools and activities supported the networking and knowledge exchange, including: a website linking an online membership; print, radio and other audio-visual resources; and face-to-face networking events. *AfricaAdapt* also provides small grants to test new ways of transforming adaptation knowledge into forms that can be used by African communities at risk from climate change.

In its first phase, *AfricaAdapt* attracted some 1000 registered members—80% of them in Africa. It recruited and built a strong cadre of knowledge-sharing officers, housed in each of its four partner organizations, and convinced over 125 diverse institutions of the value of sharing their climate change knowledge on the network website. In its first two rounds, the small grants fund supported 15 innovative projects on engaging hard-to-reach groups. The network published newsletters, helped launch a new magazine, *JotoAfrika*, and hosted a series of successful 'meet-and-greet' gatherings at national and community levels. In early 2010, it hosted its first continent-wide symposium, drawing nearly 200 participants. As of July 2011, there had been some 7000 downloads of information from the symposium website.

In its second phase, *AfricaAdapt* is strengthening its mission of enhancing resilience and reducing vulnerability to climate change by bringing disconnected stakeholders together. It is deepening the culture of knowledge sharing on the continent and raising the profile of African knowledge and research. Based on learning so far, Phase 2 continues its focus on practical knowledge-sharing activities, but aims for an improved governance structure, wider geographic reach, and enhanced outcome-based monitoring and evaluation.

Conference Support Fund

As a part of its support for networking among African scientists, policymakers and community representatives, both within Africa and more widely, CCAA supported African participation in conferences related to climate change. Through the establishment of a Conference Support Fund, CCAA has supported 44 people and 29 institutions to take part in or organize events on adaptation. This allowed for increased visibility of the activities and results of the CCAA program and its partners, and facilitated the creation of new partnerships and collaborations. Annex 2-4 provides a full list of conference support granted over the life of the program.

Media outreach

From its launch, CCAA targeted the media as critical in conveying messages on the overall challenges climate change poses for Africa and on the important work of African research teams. Staff members were given training in media relations before the African program launch in Nairobi in 2006, with refresher training offered in Ottawa in 2010. The program used a combination of media-engagement tactics, including: press releases for major events, direct story pitches to journalists, support to increase the participation of journalists at international and regional climate change gatherings, packaging project stories in the form of accessible briefs, and including journalists in program-hosted workshops and roundtables.

Box 2.2 presents highlights of CCAA media coverage, and Annex 3-2 provides full details. **Coverage of CCAA events and projects grew steadily over the first four years of the program**, with a high of 63 reports captured in 2009/10. Coverage fell by some 30% in 2010/11, consistent with an overall 2009 spike and subsequent decline in global media coverage of climate change (Boykoff and Mansfield, 2011). The program and its partners also hosted fewer launch/inception events post-2009, given that most project funding took place in CCAA's first three years. CCAA web pages on IDRC's site were another key means of sharing program news and information, profiles of supported research, and results. Materials posted online were further promoted through quarterly bulletins, which reached over 2400 subscribers, and were shared with journalists.

2.4 Research legacy: support for synthesis and publication of results

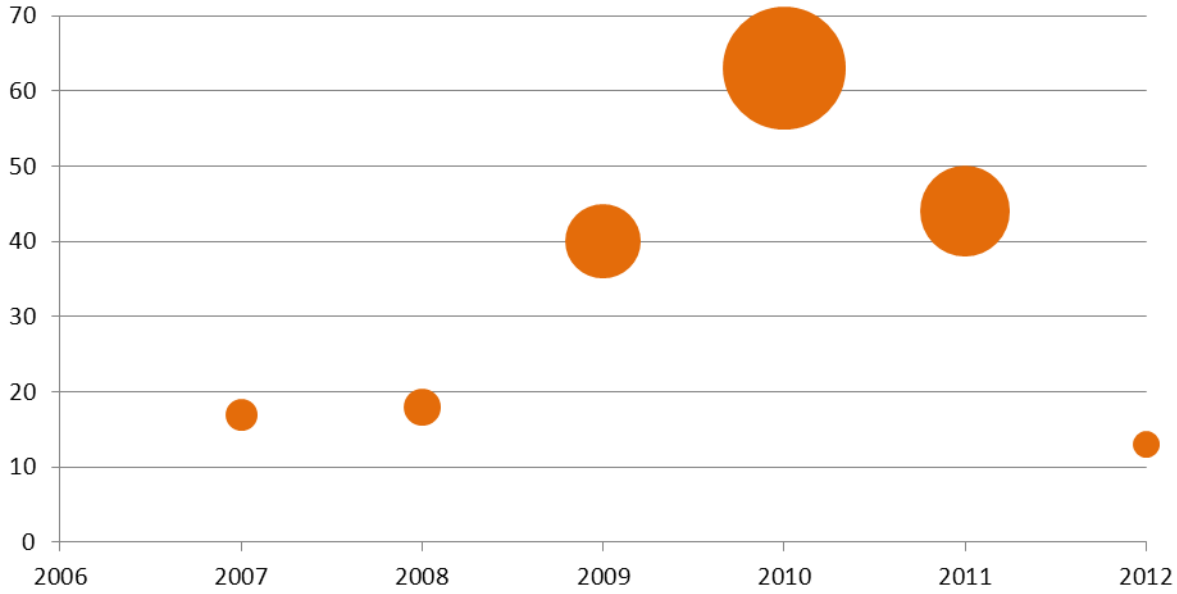
CCAA partners have engendered a rich comparative literature, covering aspects of health, rural livelihoods, agriculture, water management and coastal erosion, as well as featuring projects on urban vulnerability covering nearly 35 countries in Africa. However, while highly knowledgeable about adaptation practices and options, project partners do not always have experience engaging in peer-review processes to ensure greater visibility of their research findings. Similarly, many CCAA partners have raised important questions about adaptation, but cannot always share results with a wider scientific and policy community.

Therefore, in addition to ongoing support for knowledge sharing and publications throughout the CCAA program, CCAA also supported the synthesis and publication of research results. This focused on two areas: adaptation to climate change and experience with PAR methods. The first initiative used peer review to bring together CCAA research partners in a network under the mentorship of leading academics in climate change adaptation. Teams of researcher partners collaborated to publish key results in synthesis and individual research papers in a special issue of a peer-reviewed journal. See Annex 1-5 for the agriculture and PAR synthesis products, and Annex 1-4 for the abstracts of papers for the special issue of *Climate and Development.*

The second initiative brought together partners who applied PAR to research on agricultural systems. Given the program's focus on PAR, a set of guidance notes developed through this network will inform new programs and demonstrate the added value of PAR, as well as drawing lessons from its use. Addressing topics such as crop diversification, use of climate forecasts, soil improvement and water management, the goal of this synthesis group was to draw on the vast agricultural research conducted by CCAA to produce practical fact sheets and case studies for farmers and those who work with them. See Annex 1-5 for the PAR Guide and fact sheets.

By March 2012, there were **195** media articles and broadcasts on the CCAA program and projects.

CCAA Media Hits by Year, 2007–2011



CCAA program web pages on the IDRC website had drawn over **85,000** unique visitors.

Web contents were also shared through an e-bulletin, *Adaptation Africa,* which had **2414** subscribers.

Selected highlights of media coverage for CCAA

- France 5 television documentary series, Sales temps pour la planète, broadcast 2010, features CCAA-supported research on Morocco's coastal vulnerability.
- Canada's Globe and Mail front page coverage, 2009, includes CCAA projects on malaria prediction in Kenya and water risk in South Africa.
- The UK Independent, 2010, profiles research on indigenous weather forecasting in Kenya and drought-tolerant rooibos tea in South Africa.
- Radio Canada, SciDev.net, and UNHCR's IRIN news network, interview team leader Fatima Denton, 2009.
- The journal Nature and CBC's flagship news programme *The National* interview programme officer Guy Jobbins, 2007.

Box 2.2: CCAA media coverage, 2007–2011

2.5 Policy legacy: a final push for research into use

The long-term benefits of the CCAA program will depend largely on policymakers and practitioners accessing and acting on CCAA findings. Therefore, CCAA developed a Research into Use (RiU) strategy to target key policy stakeholders with strategic messages from the program overall. **The RiU plan had two goals:**

1. to maximize the likelihood of CCAA research findings reaching high-profile and influential arenas
2. to capture lessons learnt about innovative adaptation options, achieved for different vulnerable social groups in different contexts and environments across the continent and that could be incorporated into future national development plans in Africa.

In order to achieve these goals, CCAA initiated a process of:

- identifying key messages emerging from CCAA results and corresponding target audiences, and communicating these messages through the production of a series of knowledge products and engagements with key policy stakeholders
- identifying "climate champions" – key figures in the field of climate change adaptation who could relay the results of CCAA research in relevant arenas
- increasing the visibility and impact of CCAA results in key policy arenas at the African and global levels to ensure policy uptake
- ensuring media coverage by supporting local journalists to cover these events.

At the 17th Conference of the Parties (COP17) to the UNFCCC, CCAA supported its partners in highlighting key adaptation issues. In the lead-up to COP17, CCAA partners presented at the Climate Change and Development in Africa conference in Addis Ababa, the inaugural meeting to frame climate change and development priorities for Africa in anticipation of the COP. Through the targeted RiU strategy for participating in these events, CCAA continued to work towards solidifying connections between program results and the policy arena.

From its inception, CCAA sought to inform policymakers of the opportunities available through its suite of projects. The first CCAA inception workshop was launched in Addis Ababa, because of that city's good representation of policy communities and donor agencies. The United Nations Economic Commission for Africa (UNECA) convened the workshop, bringing together representatives of many policy and regional economic communities. This provided an opportunity for key stakeholders to recognize the potential of the program in adaptation research.

In response, the CCAA PMU decided to identify opportunistic moments in which to act on demand from policy institutions. **CCAA felt it could have a hand in changing or maintaining policy content and/or process by deliberately producing knowledge that could be useful for policymakers.** For example, the program identified capacity needs that would help the Dakar-

based Interim Secretariat of the New Partnership for Africa's Development (SINEPAD) in meeting some of its environment mandate and in delivering climate change projects.

CCAA helped SINEPAD to expand its knowledge and interest to adaptation issues, as a development of its previous focus on mitigation. The program was instrumental in extending SINEPAD's reach to understand the adaptation potential in Central Africa, and to identify key stakeholders and their capacity needs in this region. CCAA supported SINEPAD in organizing a meeting in 2009, in Douala, to identify strategies for developing adaptation activities in the region.

The PMU maintained an active engagement in policymaking on adaptation, including identifying capacity needs, and stimulating demand. Consequently, at the July 2010 AMCEN meeting in Bamako, the PMU was able to identify needs from key regional organizations such as the Southern African Development Community (SADC). The PMU facilitated SADC in establishing a climate change unit, and similarly assisted the East African Community.

The PMU developed its appreciation of strategies for brokering partnerships. Working with policy organizations enabled the PMU to understand that timing and opportunity are two primary factors in managing effective and sustainable policy relations. This important work on identifying policy needs was helpful in enabling the PMU to understand what it needed to facilitate the devolution process. Thus, it was able to place more emphasis on devolution and the role that different organizations could play in ensuring that the CCAA program successfully transfered responsibility to African organizations.

2.6 Institutional legacy: devolution to African institutions

Following CCAA's success in building the capacity of African institutions, shifting leadership of program activities to strong African institutions was an important part of CCAA's legacy. The extension of the CCAA program agreed between the UK Department for International Development (DFID) and IDRC in 2010 prioritized devolution of two major initiatives, as well as program-level activities. The ACCFP is now led by Tanzania's Institute of Resource Assessment (IRA) of the University of Dar es Salaam (see Subsection 2.2 above), and the *AfricaAdapt* knowledge-exchange network was devolved to the Dakar-based international NGO, ENDA–Tiers Monde (see Subsection 2.3 above).

At the overall program level, CCAA also decided to pursue devolution to an African Research Policy Forum on Climate Change Adaptation. **The overall aim of this platform is to support links between scientists and policymakers to facilitate the development of policy options for decisionmakers at all levels** (local, national, regional and continental). The platform will provide guidance to national governments on how best to make use of funds such as the Adaptation Fund, the Green Fund, the Great Green Wall Initiative, and existing instruments such as National Adaptation Programs of Action (NAPAs). The Forum will also contribute to strategic debates at continental and international meetings to establish an African position on adaptation to climate change.

The *Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles* (CORAF) will lead this platform. To achieve the devolution of this policy platform, IDRC approved CAD$3 million in funding to CORAF through a new IDRC program on Climate Change and Water (CCW) to support the devolution process. CORAF also connected with *AfricaAdapt* soon after being selected for devolution in order to catalyse synergy between knowledge sharing and policy initiatives, ensuring that climate change adaptation knowledge is relevant and accessible for policymakers.

In summary, the CCAA program approached climate change adaptation with a set of strategies informed by solid knowledge of the African context, and the implications of climate change and development for the continent. With the initial strategic framework in place, CCAA went into action: Section 3 now presents the results.

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Section 3 – The Climate Change Adaptation in Africa program results: assessing the adaptation value chain

The Program Management Unit (PMU) monitored the Climate Change Adaptation in Africa (CCAA) program activities throughout the life of the program against the four CCAA outcome areas:

1. Research teams are better able to assess climate-related vulnerabilities and to evaluate and develop adaptation options.
2. At-risk groups, policymakers and researchers share learning and expertise on climate vulnerability and poverty.
3. The poor in rural and urban environments apply their experience of adaptation with the knowledge and technologies generated by research to implement improved and effective adaptation strategies.
4. Policy processes are informed by good-quality science-based work on vulnerability and adaptation, and by the experiences of the rural and urban poor.

These outcome areas have provided a theory of change for the program, allowing the team to track its progress. Monitoring has focused on how project and programmatic initiatives have contributed to realizing these four outcomes by influencing the strategies, accomplishments and behaviours of those affected by CCAA.

Sections 3.1 to 3.4 look at each of these outcome areas in turn, assessing CCAA's contributions and providing specific examples of project activities and learning. However, the four outcomes are inter-related: improving research capacity increases a body of locally relevant knowledge on adaptation, which stakeholders can in turn share among themselves and feed into policy processes.

3.1 Building research capacity

Outcome Area 1: Research teams are better able to assess climate-related vulnerabilities and to evaluate and develop adaptation options.

Introduction: capacity needs and PAR as an entry point

The CCAA program provided an opportunity for African scientists to focus on adaptation realities within their environments. The research community in Africa faced numerous challenges, including:

- stakeholders' limited understanding of adaptation-related issues and how these intersect with development

- poor research infrastructure coupled with limited technical, scientific and organizational capacity to undertake effective research programs
- absence of methodological tools or skills to use available tools and engage vulnerable communities in adaptation research
- invisibility of climate change matters in higher educational programs and research agendas of academic institutions.

At the program outset, the situational analysis revealed that it was important to develop capacities and offer options combining knowledge generation and acquisition in natural sciences, social sciences and methodological tools. These would enable the program to support vulnerable communities in their assessment of their own vulnerability, as well as in their choice and implementation of adaptation options. In addition, researchers should be able to share knowledge and understand the political processes they can use to influence adaptation-related decision making.

Participatory Action Research (PAR), the methodological approach of the CCAA program, is a dynamic social learning and collective experimentation process oriented toward change and capacity building. **PAR features cycles of reflection–planning–action to analyse and correct strategies and options during their implementation.** By establishing spaces for inclusion and dialogue, PAR promotes ownership of the process, collaborative research and collective learning, from which innovative ideas may emerge.

PAR is not new, but its application is very recent in the area of climate change adaptation. At the time of CCAA's launch, very few researchers involved in the projects had previous experience in PAR, and so one early task was to develop skills in this area. PAR is also relevant to the implementation of the other three CCAA objectives – knowledge sharing, mobilizing vulnerable communities and collaborating with policy- and decision makers.

Developing relevant skills and tools, focusing on vulnerability

The argument often used to explain why Africa has difficulties addressing climate change is its limited capacity and the multiple underlying factors including skill and knowledge shortages, both individually and institutionally. Creating a critical mass of skills that can provide endogenous responses to this challenge naturally became one objective of CCAA. This explains why capacity building is not only central to the program strategy but also necessary to sustain it.

The workshops in PAR and related methodologies gave researchers a strong basis for vulnerability analysis, building capacities to assess both social and biophysical vulnerability, for example, through the workshop on integrated risk management. The research team of the *Agricultural Adaptation in Madagascar* project relied on some of the tools acquired within this training to assess vulnerability in three types of production (agroforestry in the east, stockbreeding in the southwest, and rice growing in the plateau region). It identified the factors contributing to exposure, sensitivity to the adaptation capacity of these systems and means to

reduce their vulnerability. This approach helped to reveal vulnerability linked to biophysical factors, and was used to demonstrate practical alternatives. **For example, cultivating vanilla and pepper might be an alternative to cloves, because of their greater resilience to increasing wind storms associated with climate change.**

Vulnerability assessments often highlight potential impacts of climate change on physical and human resources, but remain silent on other underlying factors contributing to such vulnerability, most of which have to do with socio-economic issues and governance. Many CCAA project teams recognized this by combining various approaches and methods, such as modelling, climatic scenarios, vulnerability mapping, social surveys and focus groups. Physical and social vulnerability mapping in the *Sea Level Rise in the Nile Delta* project identified critical zones. Further analysis revealed that vulnerability varied from place to place due to complex interactions between different biophysical impacts such as inundation and salt-water intrusion, demographic and land-use trends, and livelihoods and social contexts. In *Pastoralists and Nomadic Livestock in Kenya*, researchers also used a mixed approach, assessing vulnerability based on social surveys, climatic temperature and rainfall modelling, and an ecosystem analysis.

Resilient Cities **researchers refined their understanding of urban vulnerability through knowledge and skills acquired in CCAA training sessions.** They combined the acquired tools with hydrologic models to determine an appropriate response strategy. In Accra, the scenarios based on this approach allowed vulnerability 'pockets' to be more accurately identified on water supply, waste-water management and flooding. In Addis, preliminary work using these tools revealed the extreme vulnerability of smallholder farmers in relation to river pollution likely to be aggravated by the impacts of climate change.

In the *Urban Adaptation in Cotonou* project, the research team looked at how to protect urban Cotonou from flooding exacerbated by climate change. The researchers assessed vulnerability through two studies: one established baseline vulnerability and used climate modelling to assess potential impacts of climate change, and a second examined the effects of land-use planning on vulnerability to flooding. Researchers recognized that vulnerabilities related to land-use planning stem from institutional obstacles such as lack of appropriate laws and regulations, and/or insufficient capacity to implement existing regulations. Therefore, **in developing adaptation options, the researchers have emphasized the need for strategies that will enhance cooperation between communities and governments at both local and national levels**, to ensure that policies and regulations relating to adaptation to flooding take social vulnerabilities into account.

Many projects also benefited from CCAA training in other techniques, such as outcome mapping (OM), by developing a participatory monitoring system to measure progress towards objectives, and changes in attitudes and behaviours regarding adaptation. When combined, the different tools (such as OM, PAR, monitoring and evaluation, and gender integration) significantly contributed to a better understanding of entry points to strengthen researchers' knowledge and

skills in vulnerability analysis. This increased their capacity to design, monitor and document adaptation strategies implemented in partnership with other actors.

Another example illustrating the diversity of capacities acquired by CCAA partners was the *Challenge Fund* project. This project focused on developing social infrastructure and the capacity of vulnerable groups to demand what they need for adaptation. **By increasing capacity to diversify income sources in order to pre-empt external shocks, which include climatic shocks, *Challenge Fund* strengthened the economic autonomy of vulnerable groups, especially women.** Other project impacts in terms of capacity development included:

- through training workshops, developing a better understanding of climate change challenges, and how these affect livelihoods
- steering, monitoring and evaluation of actions
- financial management and rendering of accounts
- assessing informational and training needs.

Strengthening technical and organizational capacities of community associations and their members was a way of sustaining the CCAA program and its activities. **The skills acquired through the *Challenge Fund* project were reinvested in new adaptation activities.** For many partners, the acquisition of new skills opened up new spheres of collaboration and learning. Strengthening the link between research and policy was another important outcome of capacity-building activities in research, as detailed in Subsection 3.4.

The African Climate Change Fellowship Program (ACCFP)

Apart from the program's effort to train researchers and other stakeholders in relevant methodologies, CCAA also sought to promote higher education of African students in the field of climate change, especially through the African Climate Change Fellowship Program (ACCFP), as described in Subsection 2.2 above. **The most meaningful outcome of the fellowship program was the creation of an active and committed community of young researchers and professionals,** and of institutions capable of advancing adaptation science and applying its results for the benefit of vulnerable communities. As a result of their participation in the program, Fellows commented on the benefits of acquiring new skills and knowledge of climate change, and on their increased faith in South–South, and particularly inter-African, cooperation.

By 2011, ACCFP Fellows had published some 18 papers in peer-reviewed journals, and made more than 35 presentations at approximately 30 conferences. The African Union asked one graduate of the post-doctoral program to prepare articles on aspects of adaptation policy to enhance African negotiators' capacities at Copenhagen COP15. Another graduate was requested to take part in dialogues with Nigerian officials at the 3rd Lagos summit on climate change. Further benefits of this program included capacity development of partnering institutions, the African Academy of Sciences (AAS) and the Institute of Resource Assessment (IRA), in aspects

of data management, grant administration, organization of major events and communication skills. Both organizations reported increased confidence in running this type of program, even if some structural gaps remained.

The Fellows' host and home organizations also developed capacities in the process of participating in ACCFP; many supervisors from host organizations reported that they adjusted their programs and integrated more aspects of climate change. According to some scholars, the renewed interest of their home organizations in research on adaptation to climate change, and particularly concerning vulnerable communities, related to experience acquired within the framework of the CCAA program. One major challenge, however, is to involve more host organizations, to generate more interest and more institutional interactions. These interactions are a good basis for future institutional collaboration and program sustainability beyond the ACCFP's Phase 2.

Ensuring research visibility through peer-reviewed publications

Another indicator of increased research capacity for vulnerability assessments and the development of adaptation options was the increased visibility of researchers' work through participation in the Intergovernmental Panel on Climate Change (IPCC) and publication of peer-reviewed articles. **Eleven people associated with CCAA were authors or editors on the IPCC Fifth Assessment report.** Given that the IPCC is the international scientific body responsible for informing international policy on climate change risks, this is a clear demonstration of the increased capacity of researchers connected with CCAA.

Furthermore, the IPCC draws its assessment mainly from peer-reviewed literature. Thus, peer-reviewed publications are an indicator of partners' research capacity and the impact that their research will have in key policy arenas. By the end of 2011, CCAA research partners had published results of PAR projects in 28 peer-reviewed publications (see Annex 1-3 for a full bibliography of these publications and copies of the articles). Knowledge-sharing and capacity-building projects also resulted in an additional 18 peer-reviewed papers, including 14 by Fellows of the ACCFP (these are also listed in Annex 1-3).

CCAA also partnered with the International Institute for Environment and Development (IIED) to support a peer-review mentoring network for many of its research partners. Through this network, research partners came together under the mentorship of leading scholars in the field of adaptation to synthesize and publish their results in a special issue of the high-impact journal, *Climate and Development*. **The mentorship model forged important connections between CCAA-supported researchers and internationally renowned scholars** in the field, providing enhanced opportunities for networking. Furthermore, in addition to increasing the profile of the African researchers involved, this initiative ensured that their important contributions were taken into account by those planning and creating adaptation policy.

Examples of unanticipated successes

There are many examples of the results achieved in terms of capacity development. In some cases, these exceeded the program's expectations, such as:

- expertise acquired by some ACCFP Fellows at the end of their training period which enabled them to intervene at a high level
- graduate students trained through their involvement in PAR projects to fulfil graduate research requirements
- climate change programs established in some universities (such as the University of Dar es Salam) and/or curricula readjusted to incorporate climate change following Phase 1 of the ACCFP
- the amount of knowledge and analytical skills related to climate change gained by some community leaders or farmers who were not particularly targeted by the program other than through research institutions.

Other emerging organizations, such as the NGO Initiatives pour un Développement Intégré Durable (IDID) in Benin, not previously involved in climate change research, also acquired champion status in this field quite rapidly thanks to the capacities acquired through various CCAA activities. IDID then attracted funding from strategic adaptation programs such as the United Nations Development Programme (UNDP) Climate Change and Development Initiatives (CC DARE), and it remains the organization chosen to provide orientation to the Ministry of Environment in Benin on matters related to National Adaptation Programs of Action (NAPAs).

Also as a result of involvement in CCAA, the Centre de Suivi Ecologique in Senegal was designated leading Adaptation National Implementing Entity (NIE). The International Water Management Institute (IWMI), in Ghana and Ethiopia, is in the process of developing new capacities on climate change. The NGO Innovation, Environnement, Développement Afrique (IED) in Senegal, which had not previously included climate change in its research agenda, subsequently added community climate change adaptation to its capacities.

3.2 Brokering partnerships and building knowledge platforms

Outcome Area 2: At-risk groups, policymakers and researchers share learning and expertise on climate vulnerability and poverty

Introduction: making links to share knowledge

There is growing recognition that different strands of knowledge are required to enable effective adaptation of vulnerable communities. Farmers with relevant knowledge on which farming practices to undertake for various climate scenarios will be less vulnerable to climate risk. Similarly, timely knowledge on the range of viable crop varieties and water-harvesting technologies in given seasons will help vulnerable farmers in improving their yields in difficult conditions. New knowledge will assist policymakers in identifying and establishing appropriate interventions, policies and institutions to support strategies for risk management. In this subsection, we report the innovative ways in which CCAA-funded projects brokered partnerships for learning and for exchanging knowledge.

Knowledge generation and exchange in CCAA projects

A significant proportion of CCAA projects were agriculture-based, often using agricultural innovation systems. Innovation systems map out the key actors and their interactions that enable farmers, for example, to obtain access to technologies. Six CCAA projects in East and Southern Africa worked together using innovation systems and PAR to generate and share new knowledge among vulnerable groups, practitioners and policymakers. Table 3.1 shows the typical innovation system established in Gedarif State, Sudan by the *Managing Risk in the Horn of Africa* project, and Box 3.1 gives an example of the collaborative approach to solving a particular problem.

In all six projects, the scientific researchers from various sectors contributed to capacity-development initiatives, scientific knowledge and tools around a given technology, and information on impacts of climate change. They also brought ideas for financing and market-development models, and enabled access to education on farm inputs and management. The community stakeholders contributed their indigenous and local knowledge. **Organized around learning centres or farmer field schools, community groups aimed to participate as researchers in their own right within the innovation system, as opposed to being passive interviewees.** Together, researchers and community members integrated both sets of knowledge to emerge with compromise: climate-smart innovations ready for pilot-testing by communities.

Table 3.1: The agricultural innovation system in Gedarif, Sudan

Institution	Sector/actors	Role in PAR
University of Gedarif	Academic	Convened workshops and provided experimental fields.
Agricultural Research Corporation (ARC)	Public sector R&D	Conducted field experiments at both experimental and farmers' fields and used the fields for demonstration and extension activities.
CTC Group (farm machinery)	Private sector	Provided equipment (e.g. ridger for experimentation); also participated in technology-design discussion.
Ministry of Agriculture and Forestry (MOAF) and Sudan Meteorology Authority (SMA)	Public sector	The Extension Department of the Ministry at Gedarif State helped in dissemination of information and technologies to farmers through different media and farmers' field gatherings. SMA worked together with the farmers, ARC, and MOAF on the seasonal forecast workshops, and provided climate information to farmers through local media and personal communication.
Farmer groups (various)	Community	Gedarif Farmers Association (GFA) selected active farmers to provide their fields for piloting and adoption of the cultural practices identified by the researchers from the ARC. Also GFA gathered farmers for workshops, field days and demonstration fields. The GFA participated in the research needs assessment workshop.

Box 3.1: Agricultural innovation in Gedarif, Sudan

Using PAR, stakeholders in the *Managing Risks in the Horn of Africa* project identified the need to design a mechanized planter that would allow for furrows with deep ridges for maximum water harvesting and retention, as well as deep dropping of seeds in the ridges and plant population management. The multi-disciplinary, multi-sector project team included researchers from the private and public sectors, government officials (agriculture and meteorology), local farmers and contributors from the private sector (Gedarif-based farm machinery, fertilizer and seed companies).

The team reached consensus on how to achieve these characteristics using a single farm implement, building on local knowledge and traditional methods, resulting in the development of the Water-Harvesting Inter-row Planter (WaHIP). Use of the WaHIP-derived *in-situ* water harvesting and deep planter resulted in 882kg/ha of sorghum grain, compared to traditional methods resulting in 634kg/ha. Rainwater productivity doubled, from 0.1kg/m^3 to 0.2kg/m^3, compared with the traditional method.

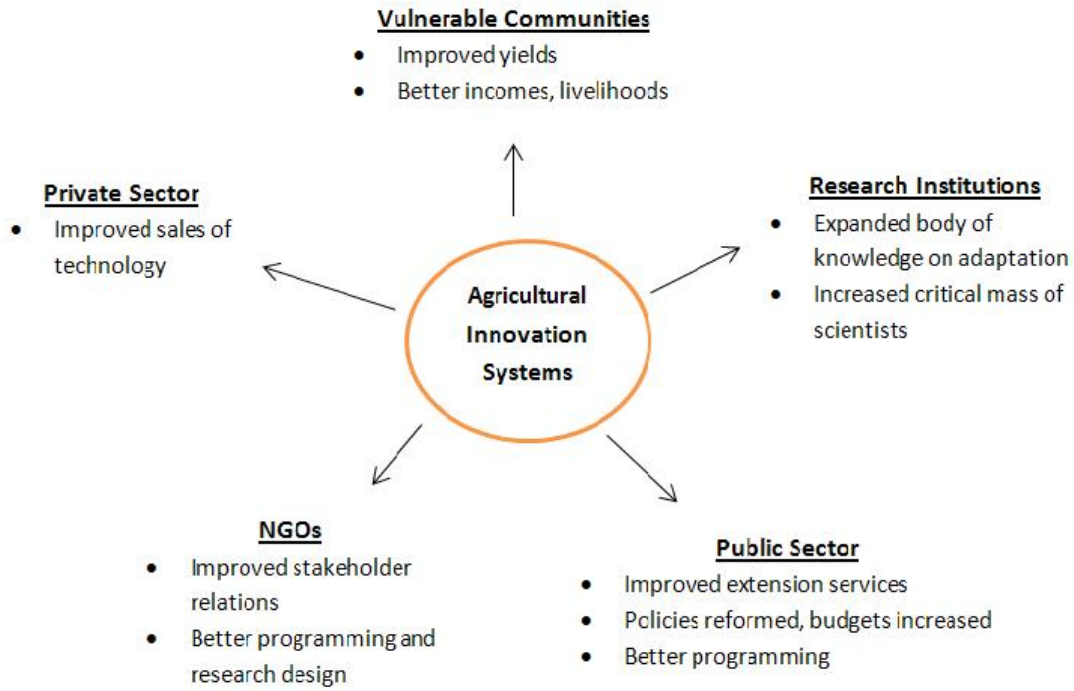
Following successful testing of the WaHIP unit in 2010, feedback was integrated into design and production of three more units. These were built by the Gedarif State Ministry of Agriculture under supervision of the ARC researcher to widen and extend testing in larger numbers of farmers' fields in 2011. Through this process, knowledge on design and production was transferred from the R&D community to the public sector, where the Ministry may now coordinate future training for technicians and engineers.

Photo: IDRC/Evans Kituyi
The WaHIP planter developed by ARC Sudan researchers

Figure 3.1 shows a range of benefits to the various stakeholder groups arising from the innovation systems**. After using climate information over two seasons to plan their farming activities with improved crop yields, farmers began regularly asking for climate information from extension workers** in Sudan and other sites under the *Managing Risks* project, including Kenya and Tanzania. In Sudan, for instance, by late 2010, about 280 farmers had further purchased and installed their own rain gauges on farms, signifying the importance they attach to climate information.

Similarly, because of exposure and education of rural communities, the stigma associated with being a traditional seasonal forecaster was removed, for example in Same, Tanzania. **Volunteering by women group leaders in Kitui District to train neighbours, fellow church members or businesswomen to adopt and carefully use seasonal forecasting advisory services was an indicator that primary learning through PAR was effective.** A key lesson learned by smallholder farmers was that use of some climate-risk management techniques, such as *in-situ* water harvesting, is not expensive.

Figure 3.1: Benefits from knowledge sharing through an agricultural innovation system



Local government departments benefited greatly from participation in these innovation systems. In the *Agricultural Innovation in Tanzania and Malawi* project, the District Agricultural Development Officer (DADO) sanctioned integration of strategies, such as the identified and tested *in-situ* water conservation strategy, into district extension programs in Mulanje and Chikwawa districts in Malawi, completely changing how extension officers work there. Another example was the replication of learning plots to different villages by the Ministry of Agriculture in Tanzania. **In Malawi and Tanzania, a CCAA project was able to influence government purchasing policy for appropriate equipment.** In response to the *Integrating Indigenous Knowledge in Kenya* project, the Kenya Metrological Department invested US$ 63,000 in building and equipping a resource centre for collecting weather data and for integrating meteorological and traditional forecasts, as well as dissemination via Radio-Internet (RANET) and vernacular radio.

The private sector also benefited from being part of the innovation-system platform for knowledge generation and sharing. For example, the seed company SEEDCO in Malawi that participated in the *Agricultural Innovation in Tanzania and Malawi* project realized increased sales in subsequent seasons following increased demand for new crop varieties. In relation to the *Managing Risk in the Horn of Africa* project, the CTC Group (a farm-machinery marketing and international franchise company in Gedarif, Sudan) developed a business plan to scale up production of the WaHIP planter.

Innovative knowledge-sharing by research partners

The *Radio Drama to Strengthen Adaptive Capacity in Nigeria* project demonstrated that **radio drama was an effective way to strengthen the capacities of smallholder farmers to adapt to climate change**. The research team and community members involved in the *Integrating Indigenous Knowledge in Kenya* project also used drama to communicate messages on climate change adaptation options. The *Agriculture and Food Security in Benin* project liaised with a local vernacular radio station to disseminate integrated climate information and advisories on responses targeting a wide range of sectors, including education, livestock management, crop production, health, security and social services. This latter project also worked with local vernacular radio to share knowledge on integrated climate forecasts. These efforts are believed to have significantly influenced the adoption of recommended responses, given their wide reach.

Field days were instrumental in assembling a wide range of stakeholders to learn from partners' experiments. Seed and fertilizer companies, policymakers, universities and other training institutions, extension officers and farmers participated in annual field days where new knowledge was shared. Field days convened by the local extension office in Sanjaranda village in Singida, central Tanzania, for the *Agricultural Innovation in Tanzania and Malawi* project were instrumental in disseminating information on new crops, climate and water management. Teams from this and other projects in Tanzania conducted annual learning visits that brought together all the PAR partners to farmers' learning plots and their own farms. Emerging lessons

were captured and feedback was shared with partners, with follow-on improvements made where necessary.

The policy dialogue by the informal National Consultative Groups (NCGs) in Tanzania and Malawi for *Agricultural Innovation in Tanzania and Malawi* is an example of innovative institutional communication arrangements created to influence policy process. These groups—composed of government officials (environment, agriculture, health, water), leading NGOs and private-sector representatives (seed companies) in each country—received regular reports on project progress and offered guidance. In Iramba district, Tanzania, the agricultural annual budget was altered to include purchases recommended by NCGs, which emerged as a conduit for channelling grassroots experiences on adaptation to policymakers.

Outcomes of the AfricaAdapt knowledge-sharing platform

Information and Communication Technologies (ICT) based platforms are a modern way of sharing knowledge, and many projects have taken advantage of tools such as the internet. The CCAA-supported, online *AfricaAdapt* platform is outlined above in Subsection 2.3. The platform aimed to:

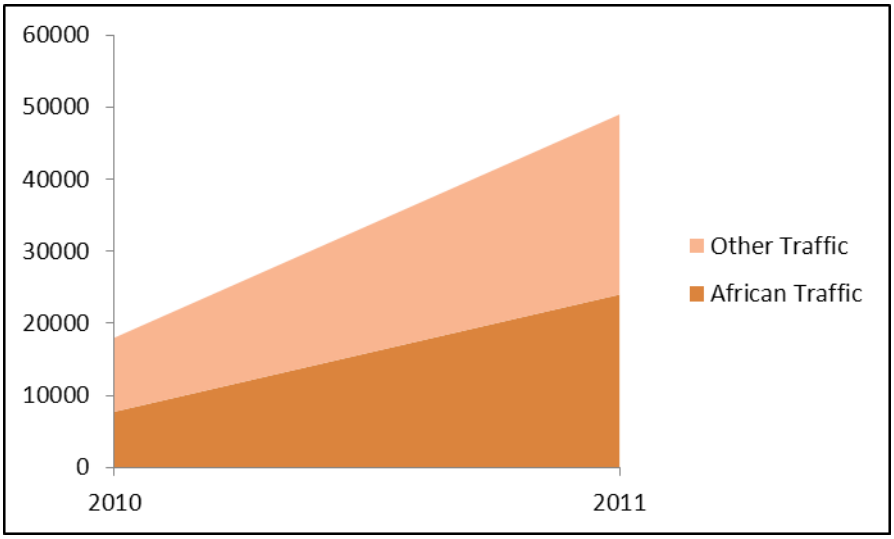
- translate information in a way that would meet the demands of stakeholders (communities, policymakers, researchers and civil society)
- build alliances and partnerships with organizations and PAR projects to learn and share knowledge on climate change adaptation
- identify and address the capacity constraints to knowledge access, sharing and use
- demonstrate the added values of a culture of knowledge sharing.

As illustrated in Box 3.2, the site took off quickly in its first two years, in terms of both website traffic and membership. At the end of Phase 1 in 2011, about 50% of the website's nearly 50,000 visitors were in Africa, and about 80% of the 1100 institutional members were located in Africa.[4] These statistics set *AfricaAdapt* apart from many other online communities, which mainly receive visitors from countries with high connectivity. Network members came from a vast array of institutions including universities, government ministries, NGOs, UN Agencies, civil society organizations, faith-based organizations and other networks.

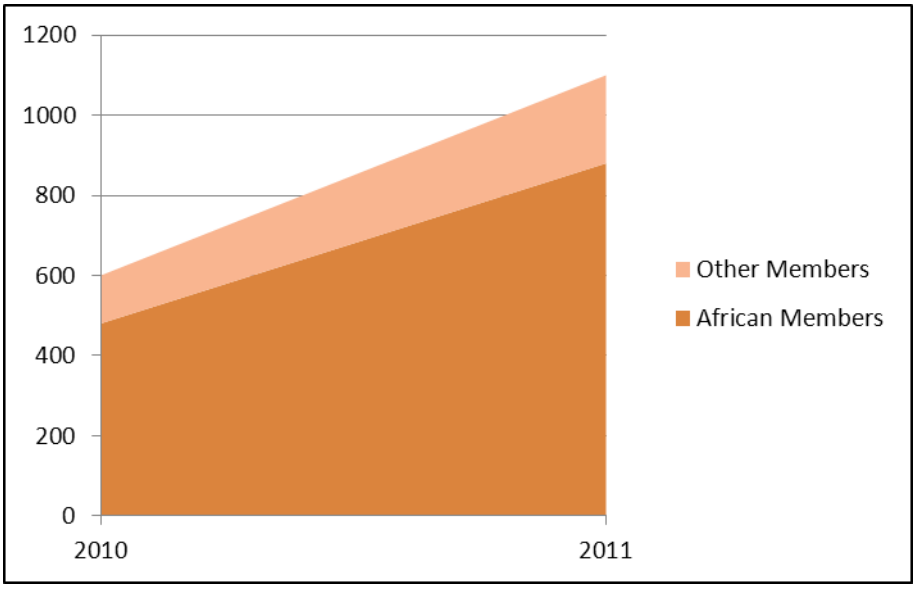
[4] These statistics do not include African visitors located outside Africa.

Box 3.2: Website statistics from *AfricaAdapt I,* June 2011

Visits to the *AfricaAdapt* website



Members of the *AfricaAdapt w*ebsite



As of June 2011:

- 25 of the top 50 visiting countries to the website were African
- There were 13,000 visits to the network's News and Events page
- More than 125 projects and initiatives were featured on the site.

Other important outcomes of *AfricaAdapt* include the establishment of a presence on other online services. Over 5600 views were reported for the 49 videos produced by the *AfricaAdapt* team and uploaded to *YouTube*. Over 50% of the views were linked to videos made about CCAA-related projects or researchers. Similarly, over 540 *Twitter* followers of *AfricaAdapt* updates were reported at close of project. These included institutions such as Wageningen University, the World Bank, the New Partnership for Africa's Development (NEPAD), the UK Department for International Development (DFID), the University of East Anglia, the UNDP's Adaptation Learning Mechanism, and the International Fund for Agricultural Development.
Key lessons from the first phase of *AfricaAdapt* were used to frame the development of Phase 2 from 2010 onwards. These lessons included:

- African researchers and collaborators are much more comfortable sharing knowledge 'offline' than 'online', hence the need for developing more offline spaces.
- Emphasis should be on creating communication spaces for effective sharing and exchange between interest groups, and promoting the value of knowledge sharing as an approach, rather than on building the technical skills for communicating knowledge.
- The ongoing delivery of a knowledge-sharing network is different from the more traditional project or program. Hence, anticipated outcomes are difficult to predict and measure, and activities required to reach them are constantly evolving, opportunistic and experimental.
- While there are many examples of adaptation projects and practices, these are often shared in only a very limited geographic space—the space constrained by individual mobility, technology and communication.
- Knowledge sharing is a process that has to stimulate demand as well as respond to it, as users are not always aware of the value of information and experience until it is made available to them in accessible communication products.

Conclusion: knowledge generation and transfer

Experiences from these initiatives serve to demonstrate the significant role of local knowledge generation and sharing as critical for adaptation. **CCAA worked on a dual track of generating knowledge, and of identifying opportunities for knowledge transfer and integration.** In this way, the program fulfilled its aspiration of building a critical mass of African professionals with the ability to generate knowledge, champion creation of knowledge-sharing platforms and ensure effective transfer of knowledge for adaptation.

Key prerequisites for effective learning and innovation platforms include: the presence of a champion to coordinate initiatives; funding to support knowledge gathering, packaging and dissemination (e.g. through internet-based platforms); and a framework of monitoring and evaluation (M&E) to verify impacts. Overwhelming evidence exists of the adaptation gains from CCAA's efforts to promote knowledge exchange. These gains include improved agricultural

yields, and better livelihood conditions attributable to the knowledge generated and shared in most projects.

3.3 Empowering the poor through knowledge

Outcome Area 3: The poor in rural and urban environments apply their experience of adaptation with the knowledge and technologies generated by research to implement improved and effective adaptation strategies.

Introduction: knowledge for adaptive learning

There are many forms of knowledge, including practical and theoretical, and improved knowledge can contribute to improved capacities. These, in turn, can contribute to empowering vulnerable communities for adaptation. However, **achieving complex goals and overcoming obstacles often requires collaboration among diverse stakeholders.** Empowering the poor can be facilitated if other actors are aware of their needs and capacities, and if they can share power and responsibilities accordingly. This process requires mutual trust, which can best be achieved through a process of joint learning. PAR has a key role in enabling this process, especially where knowledge is both diverse and complex.

Through its work in PAR and knowledge sharing, discussed in the previous two subsections, the CCAA program engaged stakeholders in cycles of joint learning and enquiry. In line with CCAA's overall strategy, this engagement included vulnerable groups, such as local communities and smallholder farmers. Through the processes and mechanisms described below, this engagement led to the empowerment of vulnerable groups through adaptive learning. In this way, poor communities were able to put knowledge and strategy on adaptation into action.

Multi-stakeholder reflection groups

Vulnerability assessments (described in Subsection 3.1) allowed research teams and their partners to identify which factors affect vulnerability and to discuss ways to reduce it. This joint learning became a catalyst for action. One mechanism through which CCAA-supported projects engaged vulnerable stakeholders was through the creation of multi-stakeholder reflection groups, or the facilitation of exchanges in existing stakeholder groups. These groups met to: conduct participatory diagnoses of climate change vulnerability, address the current or potential effects of climate change and possible adaptation options, discuss research results, and in many cases to guide the following stages of research. Members of these reflection groups sometimes also disseminated research results to the stakeholders they represented.

These groups took different forms in different contexts. For instance, they were referred to as "national and commune-level early-warning committees" in Benin, "monitoring and evaluation committees" in Burkina Faso, "*Cellules du littoral*" in Morocco, "reflection platforms" in Nigeria, a "Research to Strategic Action Plan (Re-SAP) Platform" in Ghana and Ethiopia, and "*Grupos de refleção*" in Cape Verde and Sao Tome. In many cases, partners and stakeholders worked through existing bodies to convene a space for this reflection process. For instance, in the *Flooding and Sea-Level Rise in Cape Town* project, **the University of Cape Town worked**

with the Berg River Authority, the South African water department and farmer associations to improve water management to reduce vulnerability of fruit farmers.

Through the *Challenge Fund* project, IED-Afrique worked with the *Confédération nationale des Organisations de Producteurs* in Mali, *Confédération paysanne du Faso* in Burkina and *Fédération des ONGs du Sénégal* to support the development of local adaptation strategies. These project partners worked with an existing institutional architecture of farmers' organizations, adding new capacities for managing small adaptation research projects and disseminating results. Farmers' organizations selected pilot projects, identified team needs in terms of capacity building, contracted with providers (public or private) of capacity building, and shared the information generated with at-risk groups and decision makers. The national farmers' organizations were supported by committees of researchers, policymakers, NGOs and farmers that helped with all these tasks, and served as natural channels for sharing knowledge and disseminating results.

The project reflection groups became hubs for joint learning. They facilitated the process of building consensus and allowing stakeholders to enter into dialogue and negotiation. Stakeholders were able to discuss roles, responsibilities, perceptions, stakes and processes of enabling adaptation. Such processes resulted in institutional arrangements critical for adaptation action being identified, created or strengthened. For instance, the team working on the *Health Impacts of Climate Change in Tunisia* project organized reflection groups for women in the communities of El Hichira and Mohamed Ouled. Together, they identified that the best way to reduce women's vulnerability to leishmaniosis was to reduce their exposure, which could be achieved by changes in herding patterns.

The research in Tunisia revealed that the current pattern of water use in agriculture was heightening existing vulnerability to leishmaniosis. The sandflies that transmit the illness reproduce more intensely in humid conditions, exacerbated by flood irrigation. The project, therefore, convened meetings of rural stakeholders and government on how to reduce exposure. Together, they made recommendations about practices that could prevent the spread of leishmaniosis in the area, including the introduction of drip irrigation, improved information about the quantity of water required for irrigation, and early warning systems that identify likely seasons for epidemics of leishmaniosis.

Collective governance, a process of asking questions and identifying resilience or lack of it, became the defining approach in many CCAA projects. Fostering partnership through dialogue created a 'social contract' among partners. CCAA partners reinforced the idea that adaptation processes are largely mediated by collective agreements. CCAA partners and beneficiaries identified the sources of problems and focused on vulnerability challenges. Most importantly, through such reflection groups, they were able to write, define and even un-write the rules and process of managing resilience. **Discussion on vulnerability and resilience encourages openness on whose vulnerability or resilience is being affected, and how the process of**

change and social transformation is needed to reduce the exposure of those perceived as most affected. It also highlights the fact that adaptation is inherently local and that robust and viable strategies emerge from processes tailored to local circumstances, needs and choices.

Similarly, in both Accra and Addis Ababa, researchers working on the *Resilient Cities* project created platforms that facilitated reflection. Hence, they were able to identify adaptation strategies in water management in the urban context. In the two cities, the project brought together technical experts and representatives from key local and national socio-economic institutions, facilitating a process of knowledge translation from scientific data into strategic policy advice.

In the *Rural–Urban Interactions in Nigeria* project, reflection groups were instrumental in highlighting the importance of the role of Local Government Area administrations in waste removal, road and drainage maintenance, market administration and urban planning. For example, in the urban neighbourhood of Eziukwu, the most pressing climate-related hazard is flooding, which reduces mobility and damages housing more and more frequently throughout the year. This flooding is worsened by the presence of waste that clogs up drainage channels. The associations that took part in the community platform was already facilitating a monthly clean-up. At the time of writing, the platform was working on obtaining engagements from the relevant authorities for the removal of the collected waste.

The urban community of Umuode, Nigeria, identified frequent sickness as the main concern on which to concentrate its effort within this project. In recent years, people here had seen an increase in malaria as well as waterborne diseases related to increased flooding and higher temperatures. Platform members decided to conduct sensitization campaigns to raise awareness among vulnerable groups and to construct a small healthcare centre. They were able to persuade the local government administration to take charge of healthcare in the centre once construction was completed.

In some instances, CCAA-supported projects worked with already existing groups and allowed them to include climate change considerations in their existing co-management efforts. This was the case in a study on agricultural productivity in Kitui County, Kenya, within the project *Managing Risk in the Horn of Africa.* The UN Food and Agriculture Organization (FAO) had established farmer field schools five years earlier as a part of an agroforestry program. When the FAO project ended, these farmer field schools transformed themselves into a social group that met monthly to raise funds and discuss issues relevant to the community. Researchers could therefore work with these existing groups towards the implementation of agricultural adaptation strategies.

In many cases, joint learning led to changed relationships between vulnerable groups and other stakeholders, and resulted in increased trust and self-confidence, which in turn led to empowered social groups. In the project *Rural–Urban Interdependence in Tanzania and Malawi*, the

involvement of vulnerable stakeholders through PAR and reflection groups led to restored cooperation between community members and agricultural extension services. Before this involvement, representatives of the extension service tended to lecture community members without allowing for their input or addressing implementation. **Through facilitating dialogue and increasing understanding between the extension services and community members, this project helped to ensure that adaptation strategies took into account the needs of vulnerable communities.**

Similarly, in the project *Adaptive Capacity of Smallholder Farmers across Africa*, such dialogue and trust between agricultural communities and extension services resulted in adaptation by smallholder farmers to the impacts of climate change in Zimbabwe. In the *Water Scarcity in the Saiss Basin* project in Morocco, officials from the Basin Agency took steps to ease logistical and bureaucratic obstacles for farmers applying for permits to dig wells. Similar processes occurred in the project *Pastoralists and Nomadic Livestock in Kenya* among pastoralist groups and in their relationship with policymakers. Building and restoring such relationships between scientific, policy and local communities is crucial to breaking down knowledge barriers.

Testing adaptation options

In projects on urban vulnerabilities or policy, where adaptation strategies tend to take more time to implement and take effect, evaluating and testing adaptation options through experimentation is not always feasible. On the other hand, projects focusing on agricultural and water-management practices selected adaptation options that were tested in the field with results further analysed within reflection groups. Experimentation is part of participatory action research and adaptive management, and an important element of the innovation process (Rogers, 2003; Douthwaite, 2002). **Successfully diffusing an innovation involves encouraging potential users to try it out and, when possible, to adapt it to their needs.**

The *Agriculture and Food Security in Benin* project used such experimentation in farmer field schools. The field schools functioned as reflection spaces in which to identify options for adaptation to climate change that took place through the national agro-meteorological early warning system. This system included a national-level committee and 33 commune-level committees which had bi-monthly reflections around recommendations to give to farmers based on meteorological observations and seasonal predictions.

Five farmer field schools were operated over three years in 12 of these communes, directly involving a total of 300 farmers. These groups experimented with soil-fertility management techniques that were effective in retaining water in soils. **The field schools served as demonstration plots where a great number of farmers could appreciate the comparative advantage of different soil treatments.** Some successful options tested included the simple use of manure, the association of mucuna with maize, and other particular systems of cropping and mulching.

Farmers who participated in these groups reported that they had previously attributed disruption in rain patterns to mystical causes. One of their coping strategies was to pay for sacrifices and rituals. Because of participating in the project, they now had options in their faming practice that could reduce their vulnerability. However, these practices have their limits, as they do not insulate farmers from prolonged droughts. Therefore, some of the communes involved in the project were working on plans to develop their hydro-agricultural potential and to allow farmers to irrigate.

In Zimbabwe, farmer experimentation was an essential part of the project *Adaptive Capacity of Smallholder Farmers across Africa*. The project team organized learning centres in communities in Zimbabwe, Mali, Ghana, Uganda and Tanzania. In these centres, farmers experimented with early-maturing varieties of maize, sorghum and millet, and earlier planting, as well as soil-fertility management practices combining locally available manure and chemical fertilizers. The centres connected farmers to seed networks, and tested high-protein fodder legumes to supplement livestock feed. **Experimentation was critical in demystifying certain perceptions and beliefs. For example, in Zimbabwe, local communities did not believe that high maize yield could be achieved on sandy soils. But after successful experimentation they saw an increase in productivity.**

Farmers involved in this experimentation and in the discussions organized by the learning centres changed their practices and were able to escape "early-season hunger". For example, they found that late planting of maize could reduce yield threefold, while planting early maize crops shortened the period of early-season hunger. In Ghana, migrant farmers were able to generate enough grain and income for their needs. However, in Uganda and Tanzania farmers found that an adjustment in varieties and agronomical practices was not sufficient. They saw the need, in addition to these improved agronomical practices, to change the type of crop that they planted.

Experimentation like this allowed researchers and communities to ensure that the adaptation strategies developed would be easy to implement and that subsequent problems would be dealt with as they arose. However, empowering vulnerable communities through knowledge did not stop at incorporating these groups in the research process. **CCAA research recognized that these communities possess their own first-hand, local knowledge invaluable in formulating adaptation strategies.** Vulnerable communities were therefore also empowered to share this knowledge and influence adaptation strategies, making them more relevant and effective in their specific contexts.

Integrating local and scientific knowledge

As described above in this subsection, scientists helped farmers to devise experimental protocols, and conducted surveys to verify some of the perceptions discussed in reflection meetings. In some cases, they conducted modelling to predict future impacts of different climate-change scenarios and proposed adaptation options. In others, they conducted cost-benefit analyses to help farmers choose between different options and to advocate for investments by the state.

The use of scientific methods to test and compare different local adaptation options and to document adaptation processes has the advantage of giving more weight and legitimacy to these processes. Scientific enquiry facilitates a better formal understanding of cultural aspects, the values of the different stakeholders involved and how these influence the adaptation process. However, scientists provide only some of many inputs in the learning process. PAR inherently leads to a process of multi-directional co-learning, engaging local communities to share their knowledge of conditions and strategies with researchers.

While relying solely upon indigenous knowledge is insufficient, given the rapidly fluctuating conditions brought about by climate change, scientific research provided by institutions such as meteorological services is rarely accessible to communities and farmers. This is because such research does not relate to local systems of knowledge and practice. Scientific forecasts, for example, generally address vast territories, are expressed in probabilities rather than practical terms such as dates of floods or droughts, and are often relayed in languages not widely understood by local communities. As a result, communities cannot act on this data and remain vulnerable.

Combining local and scientific knowledge through a process of co-learning can yield more durable and locally relevant adaptation processes. The fusion of different types of knowledge was the main entry point in the *Integrating Indigenous Knowledge in Kenya* project – also known as the "rainmakers". In this project, the IGAD Climate Predictions and Applications Centre (ICPAC) convened a process of integration of indigenous and scientifically based seasonal forecasts in the Nganyi community. During the life of the project, five integrated seasonal forecasts were produced with the same stakeholder groups. This stimulated reflection on the advantages and complementarities of both types of forecasts.

The integrated forecasts were convened through meetings where members of the Nganyi clan, renowned for their forecasting abilities, presented their forecast based on a number of natural indicators (including stars, plant and animal behaviour, the dispersion of bubbles blown in water in special shrines). The Kenyan Meteorological Office presented their scientifically derived forecast. The results of both forecasts were combined to develop a risk-management strategy. Subsequent meetings evaluated the accuracy and viability of previous forecasts. Farmers found that the integrated forecasts generally gave better results than forecasts done separately by either group. Furthermore, the collaborative process facilitated by PAR gave policymakers sufficient proof to appreciate local knowledge and ownership of adaptation processes. This created trust between the two groups and resulted in the Kenyan meteorological agency building a resource centre to help to conserve local knowledge (Ziervogel and Opere, 2010).

Many other projects recognized the limitations of scientifically based forecasts and explored how local forecasting approaches could fill this gap. In Tanzania, for example, researchers working on the *Managing Risk in the Horn of Africa* project collaborated with the Tanzanian Meteorological Agency to develop integrated forecasts. A learning forum on seasonal

forecasting in 2010 brought together participants from eight CCAA-supported projects. They recognized the need to integrate both types of forecasts without favouring one type (Ziervogel and Opere, 2010). Scientifically based forecasts generally give information on the probability of obtaining rain quantities more or less than normal. They give very little information on the onset of rains and their distribution throughout the season – which are estimated by most forecasts based on indigenous approaches. For these reasons, indigenous forecasts remain the most trusted source of information in many rural areas of Africa.

The integration of scientific and local knowledge was not limited to projects focusing on seasonal forecasting. For example, the *Forests in Central Africa* project convened multi-stakeholder meetings in six sites in the Democratic Republic of Congo (DRC), the Central African Republic and Cameroon. The project team found that the forest had the function of a safety net for populations living on the forest margins while being the main livelihood for some ethnic groups such as pygmies. Fishing, hunting and gathering, which were less sensitive to climate variability, were used as coping strategies to compensate for losses in slash-and-burn agriculture, for example. However, the team also found that key resources for non-timber forest products were being over-exploited and that the forest safety net could become unsustainable if used in excess.

The team then turned to the domestication of forest products as a potential adaptation option to explore. In the DRC, the project organized training on beekeeping and set up nurseries for trees on which edible caterpillars could be raised. They set up experimental plots for cultivating mushrooms and gnetum (a vine with edible leaves). The technical knowledge on domestication allowed communities to investigate turning coping strategies based on their local knowledge into more sustainable adaptation options.

The *Pastoralists and Nomadic Livestock in Kenya* project also demonstrates how local knowledge has received due primacy as a cornerstone of adaptation action. Pastoralist communities had already been developing knowledge and innovative strategies to cope with climate change, such as diversifying their herds and crops. In the absence of institutionalized processes and formal recognition, these strategies remained invisible to policymakers. Pastoralists did not receive support for their efforts, or for communicating their knowledge beyond their communities. **The participatory research process of bringing stakeholders together in this project resulted in recognition and support for indigenous knowledge and strategies to beincluded within institutional arrangements for adaptation.** For instance, the participatory processes created changes in perceptions; the Executive Brief - Kenyan National Climate Change Response Strategy (Government of Kenya, 2010) document recognized and included the rights of pastoralists to have freedom and control of resources.

These examples demonstrate how CCAA research empowered vulnerable groups—not only by involving them in the research process, but also by recognizing and embracing the invaluable

knowledge they could contribute. CCAA's unique approach to generating adaptive knowledge through participatory research made it especially successful in this area.

Conclusion: learning on empowerment

The results obtained in CCAA projects have shown that vulnerable communities can be empowered to implement adaptation knowledge through their involvement, along with other key stakeholders, in cycles of joint learning. The CCAA projects demonstrated that multi-stakeholder reflection groups are a practicable method for achieving joint learning. Some projects created their groups and others worked with existing groups. The common feature was that these groups met periodically to examine specific problems. They conducted joint enquiry, problem solving, planning and implementing, and/or experimentation. In many cases, researchers contributed a framework for analysis or experimentation, predictions of what could happen in the future under different scenarios, and/or results of surveys and measurements, to complement the information brought by other stakeholders.

The examples presented above also highlight **different ways in which knowledge can lead to empowerment and action:**

- Vulnerable groups can better understand changing climate conditions, how their vulnerability can be reduced, and some available options for adaptation.
- Stakeholders can jointly test and adjust (or eventually reject) adaptation options, resulting in the selection of options more scientifically credible and locally relevant, "owned" by all participating stakeholders.
- Stakeholders can accept uncertainty and develop some ways to manage it.
- Vulnerable groups can increase their awareness of the roles other actors can play to support their adaptation and take opportunities to ask for assistance.
- Other actors, including local, state and national governments, the private sector, and research organizations, can become aware of the capacities and needs of vulnerable groups in order to adapt.

All these actors can learn about local adaptation strategies, and how they can be supported, scaled up and made more sustainable. Barriers between vulnerable groups and other actors can be reduced, enabling them to communicate more easily. The CCAA projects also demonstrated the value of joint learning. Many CCAA projects were unique in their ability to use consensus building as a critical step in the adaptation enquiry. The integral processes of collective management and governance create a new dynamic in how environmental resources are distributed, used and managed.

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3.4 Engaging and exploiting policy spaces

Outcome Area 4: *Policy processes are informed by good-quality science-based work on vulnerability and adaptation, and by the experiences of the rural and urban poor.*

Introduction: three approaches to policy engagement

From the outset, CCAA research projects were intended to have tangible policy outcomes and consequences. Through the life of the program, PMU staff emphasized the importance of engaging with policymakers and supported policy-engagement strategies for each project. The PMU also supported policy-engagement training workshops, opportunities for project policy stakeholders to attend CCAA training workshops and developed a specific *Linking Researchers with Policy Spaces* project. This project was created as a reinforcement strategy, ensuring that if policy linkages were not created through projects, they would be addressed through this separate initiative.

Through a coordinating organization, the Institute for Development Studies (IDS), *Linking Researchers with Policy Spaces* established direct links between a group of seven CCAA partners using the PAR methodology and relevant policymakers. Hence, a small group of scientists engaged with the conceptual aspects of policy and its formulation through training in areas such as policy research methods and outcome mapping. Partners developed reflexes to map policy spaces and to match these with relevant narratives. Within their sphere of influence, partners tried to bring relevant information to the attention of policymakers.

Broadly speaking, the approaches of project teams to inform policy fell into three categories:

1. *Research as a source of knowledge*. This is a classic model of providing results to those who will use them as inputs to policy processes. Through the generation of knowledge, and working closely with policymakers, research projects attempted to inform and influence policies by providing research results. Researchers often framed research questions according to the knowledge needs of policymakers, but in some cases it was necessary to raise awareness among policymakers of the need for policy to be made.
2. *Research as a process of co-learning*. This approach is central to PAR methods (see Subsection 3.3). Co-learning involves directly engaging policymakers in research processes with other stakeholders to build understanding on shared problems.

3. *Research as a policy process*. In some cases, particularly in projects focusing on institutional dimensions of strengthening adaptive capacity, researchers deliberately set out to create or strengthen institutional processes to enhance the kind of change they envisaged. Invariably, this meant working within existing institutional arrangements and strengthening these to achieve desired results.

These approaches were not mutually exclusive – many teams took multiple approaches, depending on who they were trying to influence. The rest of this subsection examines each of these three approaches in terms of CCAA project experiences, before discussing overall achievements and challenges.

Meeting specific policy demands and knowledge needs

A classic view of the role of research in policymaking is that results and outputs of research are taken up by policymakers as inputs into their deliberations. Using markets as an analogy for knowledge as a commodity, there is a supply side (research) and a demand side (policymaking). Behind the development of CCAA was the perception that African scientists were making timid advances in generating knowledge on adaptation research. In addition, there was little evidence that the research that was being done was based on demand from either policymakers or vulnerable groups. Given the role played by other leading research programs such as Assessments of Impacts and Adaptation to Climate Change, CCAA was further expected to stimulate the research side of the equation, and to help to increase awareness and demands for knowledge by policymakers on the demand side.

The program worked closely with a number of policy-related institutions that could act as technical service providers, in order to channel critical research results to policymakers. The assumption was that research partners are indispensable conduits in brokering knowledge and sharing information within national and regional networks that will raise the profile of adaptation.

For many research teams, the main approach to influencing and informing policy was by treating policymakers as clients for their knowledge products. Some began by engaging policymakers to define questions and priorities at the beginning of their research. Others developed the research enquiry and then looked for entry points to bring in policymakers as clients as the weight of evidence got stronger.

The *New Land, New Life* project team had a long history of cooperation with the High Dam Lake Authority (HDLA) in Egypt, the principal agency responsible for social and economic development on the shores of Lake Nasser. Consulting with the HDLA, the team realized that, while they were principally interested in adaptation to impacts of climate change on human health, HDLA officials were concerned principally with agricultural development and poverty reduction. This allowed the team to establish lines of enquiry linking climate change, human health, agricultural productivity and income generation. These included work on the role of local

agricultural production in nutrition, impacts of switching to non-food crops, and the inclusion of a capacity-building and experimental component to support farmers' access to export markets to enhance income generation. Much of this research resulted in strategies adopted by HDLA, and gave the team entry points for sharing results, providing recommendations, and developing strategies on climate change and human health.

A key element of policy-engagement advice from CCAA to research partners was to follow the strategy of identifying and consulting with policy clients in advance. **Project partners sought close working relationships with key government agents in relevant ministries.** The *Agricultural Innovation in Tanzania and Malawi* project identified the agricultural ministry as a key ministry to inform research results. The DADO became an integral partner of the project. Other relevant ministries such as land, water and food production were also expected to boost innovations identified through the project.

No method is risk-free, however, and some projects learned that a tightly focused policy strategy could become a hindrance. The *Moroccan Plains and Mountains Communities* project intended to support two rural communes in preparing Community Development Plans (CDPs) that would be submitted to the central government for funding. However, in the early stages of the project, the government assigned responsibility for drafting CDPs to the Social Development Agency, an organization the team had no relationship with. One effect of this was a decreased stake in, and ownership of, the CDPs by the communes. Over three years, the team gathered evidence from research and gradually built their relationship with the communes. The communes eventually persuaded the Social Development Agency to incorporate some of the team's recommendations. Although successful, this team experienced great challenges in attempting to engage indirectly with a policy process. Other projects experienced similar challenges when a champion for the research within a policy-client organization was reassigned or retired.

From its beginning, the *Malaria Epidemic Prediction in East Africa* project targeted policy clients in the Ministry of Health. However, the research underscored the relationship between poverty and malaria, and the special needs of poor communities for health interventions. One of the key lessons was that poverty contributes to high rates of malaria and increased levels of illness and death. The models developed in the project provided the Ministry of Health with a decision-making tool to decide where and when to deploy interventions to those most at risk, having the potential to greatly benefit the poorest members of society.

Most African governments face resource constraints in their operations, including collecting and analysing data, particularly in rural areas. Many research teams were able to engage with local and national authorities by supporting their needs and priorities in these areas. Departmental heads of government ministries at the district level in Turkana and Mandera in the *Pastoralists and Nomadic Livestock in Kenya* project received and used project outputs to raise community awareness on the importance of weather information and seasonal forecasts in livelihood planning and natural resource management.

One CCAA partner in the *Moroccan Coastal Management* project has repeatedly stressed that a key element of his team's success in informing policy and building collaborative relationships leading to policy influence was through conducting numerous studies. The data from these studies furthered the adaptation agenda, but also provided authorities with basic information—on subjects ranging from socio-economic conditions to erosion hotspots and locations of fisheries—that could be used for other purposes in planning and policymaking.

Returning to the analogy of markets, many projects demonstrated that demand for information could be stimulated through supply from research. The project *Managing Risk in the Horn of Africa* saw an increase in demand for localized seasonal climate information and agro-advisory bulletins in the Kitui, Mutomo and Mwingi districts of Kenya. As a result of their work, localized seasonal climate information became the first agenda item in district development committees, advisories to farmers and all district administrative meetings. In Tanzania, the DADOs are now using climate information in making district-level decisions related to agricultural development. Similar patterns were seen in numerous projects, particularly those dealing with climate information, which demonstrated the direct utility of research products.

At the end of program, it is clear that the majority of projects achieved considerable successes in informing and even influencing policy clients. The key elements appear to have been focusing on the needs and priorities of policymakers, and relating research products to those priorities. While those who began with clearly defined policy audiences may have begun with advantages, several projects demonstrated that opportunistic and flexible strategies could also be effective. Ultimately, success depended on not just having results to share but also knowing what the policy audience needed, and using research results as the main tool to communicate effectively.

Improving decision makers' knowledge and perceptions through participatory processes

An alternative to the classic view of policymakers as users of research outputs was adopted by some projects who engaged specific policymakers in research processes. This approach to influencing policymakers is based on the concept of research as a social process, in which the expertise of multiple stakeholders can be engaged in co-learning and discovery. **Extended engagement in research processes offers policymakers new perspectives and learning opportunities, and the possibility of shaping research agendas to suit their needs.** Researchers also benefit from the opportunity to create champions, strengthen capacity, and embed research results within policy processes.

In the *Promoting PAR* project, policymakers and communities were engaged in PAR processes focused on solving location-specific adaptation challenges and reflecting on long-term challenges. The research team made a concerted effort to remain in touch with policymakers through iterative cycles of planning, action, monitoring and reflection, then re-planning and working policymakers' research demands into project activities. Researchers found that the

deliberative processes of PAR facilitated interactions and exchanges between the diverse groups of social actors and supported the emergence of coalitions despite differing interests and stakes.

Similarly, in the *Agriculture and Water in South Africa* project, the involvement of different groups in PAR processes, including the Catchment Management Agency and marginalized social groups, allowed the team to develop results and policy recommendations reflecting the experiences and needs of the poor. The team also found that involving policymakers in PAR not only raised their appreciation for the priorities and needs of the poor, but also contributed to policymakers developing new ideas on how to include PAR approaches when designing new policies and plans.

The *Adaptive Capacity of Smallholder Farmers across Africa* project provides an example of how PAR's multi-stakeholder approaches were used to identify a means of meeting the needs of vulnerable people with support from both community leaders and government agents. **Insights from integrated soil-fertility-management learning centres led to the revitalization of a traditional practice in Zimbabwe.** 'Zunde raMambo', a method of collective food production, acts as a local safety net, strengthening climate resilience through enhanced food security. Two hectares of land were donated by the local chief for participatory experiments involving community members and service providers, which gave ten-fold improvements in maize, soybean and cowpea yields even on sandy soils. These achievements also demonstrate the role of local institutions to champion safety nets, and their need for strengthened organizational capacity and technologies. The community, researchers and service providers have since developed guidelines for improving 'Zunde raMambo'.

In Morocco, the *Water Scarcity in the Saiss Basin* project brought together farmers and agricultural officials in designing irrigation experiments and discussing legal issues around access to scarce water resources with Water Management Agency officials. In addition to raising awareness among both farmers and officials about the benefits of water-saving technologies in the context of reduced rainfall, discussion also increased officials' understanding of the constraints acting on farmers with respect to obtaining permits for wells. The Department of Agriculture worked with the Water Management Agency to streamline application procedures for small farmers, and to support small farmers' access to government support services such as credit for drip-irrigation investments.

There are clearly contexts in which including policymakers in PAR processes becomes more difficult, particularly in closed regimes where the target policymakers are inaccessible for regular contact. In the *Health Impacts of Climate Change in Tunisia* project, local officials found it politically difficult to meet with communities on the kind of equitable basis required for sustained participatory engagement. However, officials were willing to engage in data sharing and joint analysis with the project team. Following the Tunisian Revolution, and under reduced restrictions, local officials were able to attend meetings and engage in debate with communities.

Research as policymaking

In much of Africa, particularly in rural areas, weak institutions and policy processes are an underlying development challenge. With climate change exposing institutional and organizational vulnerabilities, some CCAA projects went further than engaging policymakers in research, and deliberately attempted to change or create institutions, processes and/or policies as part of the research process itself (Box 3.3).

Some project teams attempted to strengthen organizational capacity by developing tools and frameworks used in decision-making processes. Examples of this approach are the projects that developed decision-support or early warning systems. *Agriculture and Water in South Africa* developed models for use by the Catchment Management Agency, *Malaria Epidemic Prediction in East Africa* developed models for predicting malaria epidemics, and *Health Impacts of Climate Change in Tunisia* developed an early-warning system for leishmaniasis.

In other cases, researchers attempted to develop partnerships, agreements and arrangements through participatory processes. With the focus of most CCAA projects being at the level of communities, many projects focused on strengthening community institutions for decision making. Many projects also attempted to strengthen institutional and organizational linkages between local communities and state actors, particularly local administrative units, communes and municipalities. This emphasis on the local level is evident in a policy map of 31 projects developed by CCAA, which shows that 119 out of 202 policy linkages established by projects were at the local level (see the CCAA Policy Map in Annex 3-3 for details).

In the *Moroccan Coastal Management* project, the team recognized the importance of coordination between different ministries and agencies in developing integrated local adaptation plans in response to sea-level rise. **In the absence of a process for policy coordination at a provincial level, the team built on 'contact groups' established for coastal planning.** With additional representatives of civil society and communities, the *cellules de littoral* became forums for the participatory analysis of project findings, and a mechanism for the exchange of information on activities and priorities of different stakeholders. With regular meetings over three years, the *cellules* became key contributors to and reviewers of the provincial adaptation plans.

Embedding the research within the administration enhanced policymakers' ownership of the policy recommendations arising. Ultimately, as adaptation measures were identified, they became policy because they had been developed through formal processes within the state administration. The adaptation strategies were approved by local governors, and the *cellules de littoral* became formally mandated institutions that the Ministry of Environment was interested in scaling up across the country.

The *Fishing Policy in West Africa* project brought together political decision-makers, researchers, representatives of fisher associations and managers of projects and programs at local, national and sub-regional meetings. The researchers gathered scientific and endogenous knowledge and facilitated participants in explorations of possible scenarios and evaluations of different adaptation strategies. As collaboration developed with the Economic Commission of West African States (ECOWAS), the last sub-regional workshops grew to include representation from 16 countries.

The project's national teams, led by national research organizations, also worked with national fisheries organizations and strengthened the capacity of local fishers' associations in Senegal, Guinea and Cape Verde. Results of research conducted by the team, including outputs and policy recommendations from participatory workshops at local levels, were examined in meetings at the national and sub-regional levels. **The network on fisheries policy established through this project continues its efforts to harmonize regional fisheries policy and adaptation, even beyond the end of the project term**, and influences the Climate Science Research Partnership as well as ECOWAS through common membership. This dialogue-based process generated evidence for policymakers and engaged them in participatory processes, and also contributed to strengthening institutional and policy processes. Scenario-building exercises led diverse stakeholders to agreements on visions of what is desirable and what needs to be avoided. This agreement fostered enthusiasm and will to act. The adaptation strategies discussed were, in many cases, resource management measures relevant even in the absence of climate change, but climate change is reinforcing the urgency to act.

Not all researchers are comfortable with such approaches, and not all are equipped to work with them. "Research as policymaking" seems to work in certain cases and relies on significant buy-in from the policy organization or a significant champion. However, in specific cases, researchers can act as "policy entrepreneurs", stepping outside their traditional role to take a more active part in policy formulation.

Box 3.3: What barriers to policy influence?

When trying to inform or influence policy, a key factor for the researcher is the current trend within the target organization. Hostile, neutral, or positive to the subject in question? How much expertise does the organization have in the subject area?

In Morocco, many public organizations were turning from neutral (unaware) to positive (desire to act) on climate change, with little internal expertise but also external pressure (from central government) to develop strategies. This meant that members of the Moroccan coastal management team were quickly able to identify policy organizations to work productively with, because there was a conducive institutional environment with a demand for their work.

In Egypt, by contrast, the level of awareness in public organizations regarding climate change was limited, with little to no direction from central government to local units. The team needed to spend considerable time building relationships and convincing local authorities to participate in the project. For some stakeholders, a familiarity with historical issues of coastal subsidence was a barrier to recognizing that sea-level rise and salt-water intrusion posed a qualitatively different problem.

Discussion: identifying channels for building knowledge on effective adaptation

Most projects adopted different approaches to policy engagement, depending on the accessibility, function and significance of the policy target. Such **flexibility and innovative combinations of approaches allowed projects to seize particular opportunities for policy engagement**, specifically through identifying direct and indirect channels, the development of new donor partnerships, and communications and knowledge-sharing initiatives.

Whichever approach they adopted, research teams took advantage of existing initiatives and mechanisms to channel their findings and recommendations to appropriate policy audiences. The timing of CCAA coincided with a period in which climate adaptation was becoming a mainstream policy issue in Africa. Early in their lifecycle, many CCAA research projects were able to identify national initiatives on climate adaptation that had mandates for data collection and sharing, national priority setting and policy coordination.

A number of project teams engaged with and added value to processes for developing national climate change and adaptation strategies. In some cases, project teams had direct access and inputs to such policies, but elsewhere projects often found indirect means of informing and/or influencing policies. Direct engagement was practised by projects in Ethiopia and Zambia. In Ethiopia, team members from *Managing Risk in the Horn of Africa*, with the Ministry of Agriculture and Rural Development, established a taskforce to develop guidelines for mainstreaming climate change issues into public policy, as well as linkages among research institutes. In Zambia, researchers from the *Community Based Adaptation in Africa* project provided inputs and support to mainstream climate adaptation objectives, strategies and programs in all 15 economic sectors of the Sixth National Development Plan (2011-2015) (Republic of Zambia, 2011). Table 3.2 provides examples from Ghana and Kenya where projects

adopted different approaches to informing policy based on their situation relative to policymakers.

Table 3.2: Examples of direct and indirect policy information by CCAA projects

Country	Direct	Indirect
Ghana: National Climate Change Policy	*Resilient Cities* Shared findings directly with the National Climate Change Committee through relationships with key decision makers.	*Health in Accra, Ghana* Initially unable to gain access to the Committee, but worked with ministries involved in the consultation to channel information. The team also interacted with the lead consultant developing a National Urban Development Policy, leading them to review the Policy's chapter on climate change.
Kenya: Climate Change Bill and Climate Change Response Strategy	*Pastoralists and Nomadic Livestock in Kenya* Identified the Response Strategy as a target for influence early in the research, resulting in the Strategy's recognition of pastoralists' freedom of mobility and right of access to and control over resources.	*Community Based Adaptation in Africa* By including governmental stakeholders in participatory activities, researchers influenced formulation of policies in the Ministries of Arid Lands, Environment, and Natural Resources.

In some cases, projects identified other routes to achieving policy information and influence. The *Sea Level Rise in the Nile Delta* project aimed to understand how different adaptation options would impact coastal communities, and how their preferences and the analysis of costs and benefits could be captured in governmental decision making and coastal planning. This project partnered with a US$16 million project funded by the Global Environment Facility and the Government of Egypt to trial adaptation options and develop an institutional and regulatory framework for climate adaptation in coastal planning. The research team's approach to selecting adaptation options was used by the implementation project, scaling up their methodology and building momentum for its adoption in the regulatory framework.

Several projects recognized the potential for donor-funded implementation projects to scale up research findings or as leverage in policy influence. Some actively engaged in developing new donor-funded projects informed by their CCAA research results. In 2009, team members of the *Integrating Indigenous Knowledge in Kenya* project began work on a Risk Reduction Project for West Kenya funded by the Great Lakes University of Kisumu and the World Bank, focusing on the flood-affected Budalangi area. Similarly, the *Moroccan Coastal Management* team built on the achievements of their project by attracting further funding. Four Global Environment Facility (GEF) Small Grant Program projects totalling US$200,000 were invested in community groups

and associations involved in participatory work, and the World Bank invested US$5 million in a coastal management project in the region from 2011/12.

Researchers also recognized the importance of political figures and institutions, where accessible, for leveraging policy influence. Researchers from the *Managing Risk in the Horn of Africa* project addressed a special session on climate change at the Tanzanian Parliament, building on training received from a CCAA workshop on engaging with parliamentarians. The *Adaptive Capacity in Agriculture in Zambia and Zimbabwe* project invited the Zambian Minister of Agriculture for a field visit. The Minister's interest added support to their findings, and to their engagement with other policy institutions and processes.

One notable feature of CCAA projects was their local focus on specific communities. The results of the policy-mapping exercise (in Annex 3-3) indicate the importance research teams placed on engaging with local and national organizations, and the relatively rare instances of engagement with regional institutions. Just 7 of the 202 total policy linkages identified for the 31 projects were with regional organizations, while 119 linkages were with local institutions and 76 with national organizations.

This local focus is a consequence of the client-based PAR approaches adopted by research teams. These concentrated attention on building relationships between the most relevant stakeholders for addressing adaptation challenges faced by local communities. This focus on institutional linkages and stakeholder relationships allowed research partners to identify institutional roots of vulnerability, arising from maladapted or absent institutions. Consequently, many partners were able to establish new institutional links and processes, and to strengthen those that were in place. This points to a key ingredient of CCAA's success: **by focusing on understanding small-scale adaptation issues and effecting small changes at local levels, research teams have unveiled key lessons about the central role of institutions for adaptation**.

It is likely that there will be further consequences of policy engagement that will not be apparent for some time. While researchers may have mastered their understanding of processes to inform and perhaps influence policy, identified the opportunities, and engaged appropriately, slow bureaucratic processes mean that certain outcomes may not have been visible within the lifecycle of the CCAA program.

Conclusion: effective influencing strategies

CCAA research teams demonstrated ingenuity and flexibility in engaging with existing policy processes and adaptation initiatives. The PAR approach was central in their strategies to inform policy by including policymakers within research processes and embedding research findings within policy processes. **An outcome and benefit of PAR is the creation of constructive relationships through sustained engagement.** Researchers have taken these concepts and

applied them in the policy sphere, using different channels to leverage policy influence beyond the extent that their levels of funding would imply.

The outcome of these efforts was that CCAA research teams built credibility with key policy actors in their countries, strengthened their capacity to influence climate change policy, enabled institutional adaptation policymaking, and influenced adaptation plans and policy decisions. These outcomes aligned with the goals of CCAA, which were to support policy-relevant research with tangible benefits.

CCAA-supported projects helped raise the profile of team members as African adaptation experts. For example, the *Moroccan Plains and Mountains Communities* research team members are now regarded as the climate adaptation specialists within the French National Institute for Agricultural Research, and are regularly consulted by the Ministry of Agriculture, as well as being called by the Ministry of Economic Affairs to provide input into donor investments in agriculture.

Research teams also gained increased recognition outside Africa. Senior researchers from the *Agricultural Innovation in Tanzania and Malawi* team were invited to present research findings to the UNFCCC Secretariat in 2009, and in 2010 six CCAA-supported researchers were appointed as Lead Authors to the IPCC's Fifth Assessment Report. This international recognition further strengthened partners' domestic credibility.

Despite these achievements, there remains much to be done. The strengthening of institutions to accompany adaptation and translate research findings into action should be a significant priority.
Understanding and managing uncertainty inherent in climate adaptation remains a significant challenge for many researchers and policy institutions. However, weaknesses in institutions and policy systems are currently likely to be more significant than uncertainties in specific research findings. Among the areas that need significant strengthening is the area of institutional capacity building for adaptive management, including capacity to evaluate adaptation initiatives. Researchers have demonstrated that PAR can help strengthen institutions and policymaking, and this suggests the value of future support for these approaches.

CCAA happened at a pivotal moment for adaptation in Africa, at a time when climate adaptation gained further momentum in mainstream debates on development. During the program's lifecycle the "market failure", which had failed to stimulate either supply of knowledge from researchers or demand for knowledge from policymakers, appeared to be overcome by raised awareness and the arrival of CCAA researchers with knowledge to share. CCAA research projects certainly benefitted from increased demand for adaptation knowledge from policymakers, but the program's legacy in influencing policy will be measurable only in the decades to come.

Reference

Republic of Zambia (2011) *Sixth National Development Plan 2011–2015*. Retrieved from: http://siteresources.worldbank.org/INTZAMBIA/Resources/SNDP_Final_Draft__20_01_2011.pdf

Section 4 – Conclusion: contributions, remaining challenges and moving forward

4.1 Reflecting on CCAA's adaptation and evolution

While the Climate Change Adaptation in Africa (CCAA) program was ambitious in its objectives, remit and activities, the working methodologies that the program employed created coherence and focus. Nonetheless, given the youthful nature of adaptation research in Africa, can we meaningfully evaluate the impacts of CCAA in the course of the program's six-year lifecycle? What were the key attributes of a program of this magnitude? How did it go about setting new trends? What distinguished CCAA from similar adaptation programs?

Environmental programs are often quite dynamic – and go through various phases of adaptation themselves. CCAA's first phase of adaptation was to find an approach that was both broad and flexible enough to embrace key elements of the complex nature of adaptation to climate change. Timing and context were key considerations. The adaptation research community in Africa was both receptive and eager. In addition, many of the emerging institutions in Africa working on climate change in Africa were keen to try out their ideas and take on a leadership role. Hence, having "tested the waters" and the appetite for adaptation research through its first call for proposals, the program quickly adapted its mandate for building research capacity. **Although the program did broaden its thematic reach, evidenced by its overall project portfolio, its main emphasis was addressing vulnerability differentials in the agricultural sector.**

The second phase of 'adaptation' was borne out of the realization that, although knowledge is a key resource in fighting climate change impacts, it is also essential to democratize the processes of knowledge generation and sharing. Hence, **a number of CCAA research projects greatly demystified the elitist tendency of perceiving knowledge as the sole preserve of the professional researcher**. Generating knowledge through a process of social learning resulted in empowering vulnerable groups who, through collaborative work with researchers, gained both trust and skills that enhanced their adaptive capacity.

Yet, adaptation requires more than framing the problem and identifying channels of research enquiry and dissemination. While many of the African scientists and researchers have good firsthand knowledge of the climate-related vulnerabilities faced by at-risk groups, they require tools, methods and research techniques to systematize their thinking, and strategies to record and monitor progress. The third phase of the CCAA program's adaptation provided partners with practical tools and techniques for realizing adaptation research.

Through its 43 projects across Africa, CCAA raised the profile of adaptation research and built capacity of African researchers in this field. Adaptation is principally conducted at a local level, and the understanding of this is reflected in CCAA's approach of adaptive co-management. Scale becomes a key factor in CCAA's 'adaptation' process and it was at the local and national levels that partners sought to effect the most profound changes—to empower vulnerable communities through knowledge sharing, to stimulate demand for adaptation research across smallholder farming and other at-risk communities, and to create a platform where farmers and affected communities could ask practical questions. **The interplay between local and national enabled CCAA partners to combine top-down and bottom-up approaches through collective engagement of key social actors.**

Perhaps a far more profound 'adaptation' adjustment that CCAA partners sought to make was at the institutional level. Partners appreciated that framing adaptation processes needs the backing of robust and resilient institutions to gain momentum and to adopt adequate governance systems that are relatively transparent and malleable to endorse adaptation work. CCAA partners identified existing institutions they could work with, often mobilizing the political, social and institutional resources they needed—for example, to test the use of irrigation techniques or methods of drainage to prevent urban flooding. In some cases, partners worked to strengthen institutions by involving them and holding them accountable.

CCAA partners used research and knowledge to reinforce the message on the pace and severity of change. The acquisition and sharing of new knowledge brought about a degree of awareness among farmers, fishers, health groups, pastoralists and foresters, among others. **Generating knowledge through social learning also resulted in empowering vulnerable groups through collaborative work with researchers.** Consequently, these vulnerable groups gained a sense of trust, ownership, and skills in adaptation knowledge. CCAA research reinforced the belief that top-down centralized systems of governance alone are not suitable for the management of common property resources. It has demonstrated that forming cohesive networks and social processes, such as through Participatory Action Research (PAR), is effective in enhancing adaptive capacity.

It is hard to establish boundaries between adaptive management processes and social learning, and there are strong connections between the two. CCAA's partners have shown that both institutional and social learning are key parts of the process of making adaptation more effective. For instance, the *Pastoralists and Nomadic Livestock in Kenya* project helped communities manage pastures for dry-season grazing by setting aside areas to allow it to seed, regenerate and feed the herds. The project facilitated the elaboration of participatory pasture management plans and saw an increase in the number of grazing committees. Related to this, the project reaffirmed the importance of livestock mobility within and between state borders as an existing and viable adaptation strategy.

A notable feature of CCAA projects is their ability to broker partnerships between groups that do not traditionally work together and may have diverging adaptation interests. In particular, **many projects discovered that partnerships, such as linking communities to key governance agents, were crucial**. For example, in Senegal, the project on seasonal forecasting *InfoClim* has facilitated communication between local committees and the government. Consequently, key stakeholders in this project, such as the NGO Green Senegal, are now routinely integrating climate change into new local development plans.

By seeking participation from core groups of social actors and using PAR to enrich the process of engagement, CCAA partners integrated inclusive governance as a staple component of building adaptive capacity. This process of engaging local actors reinforced the message that their perspectives, local context and knowledge matter. This deliberative process of building coalitions, seeking knowledge through interactions and productive partnerships, and testing and contesting knowledge, yielded many good results and activated societal adaptation in many of CCAA's projects.

CCAA projects tested many adaptation options to gauge their viability and potential uptake by vulnerable groups. In Benin, Burkina Faso and Malawi, farmers tested different soil-management practices, to increase crop resilience to dry spells. In a project on urban vulnerability in Nigeria, communities experimented with simple drainage techniques to prevent flooding of their neighbourhoods. These processes and options are not new in themselves—they were known about, although not always practised. CCAA's ground-breaking contribution here was the approach of linking these practices to social and institutional contexts, and engaging communities in the effective implementation of adaptive practices.

4.2 Assessing CCAA's contribution to building knowledge in adaptation research

The focus of CCAA was to strengthen the capacity of Africans to adapt to climate change through improved research and research capacity. The program aimed to stimulate an African market for adaptation research, and to encourage both demand and supply of adaptation knowledge.

CCAA recognized that traditional research organizations, such as universities, do not have a monopoly on knowledge. The poorest and most vulnerable people in Africa, remote from markets and public services, are self-reliant innovators. They also draw on traditional knowledge systems crucial to decision making in agriculture and health, and have profound understanding of their own livelihoods systems. State organizations, too, have critical knowledge, with mandates to orient programs and policies to societal goals. CCAA's support for PAR is an explicit recognition of the potential synergies that lie in the increased exchange of knowledge, and knowledge building, between these stakeholders.

CCAA focused its direct engagement on the research community of African scientists and social scientists as natural relays for promoting knowledge exchange and capacity development in Africa. When the program began, many African researchers were working on problems related to development—human health, agriculture and food security, or water management—but few were doing so with a climate change perspective. Few African scientists were among the authors of the IPCC's Fourth Assessment Report, for example, reflecting the relative lack of African voices and experience in the global science and policy of climate change.

The CCAA program prioritized supporting a new wave of African adaptation researchers, encompassing both junior scientists with no previous record of external funding and more experienced researchers with no previous work on climate adaptation. IDRC's "Grant Plus" model, emphasizing continued support from program staff to project researchers, has been a crucial part of the "learning through doing" approach to capacity development through research. In addition, the program's capacity-strengthening, training, and knowledge-sharing activities were all employed to support this strategy. Consequently, **CCAA made a significant contribution to the increased numbers and capacities of African scientists now working on climate change adaptation**.

CCAA-supported research tackled a wide range of adaptation problems, from selecting appropriate sea-defence strategies to increasing resilience in smallholder agriculture. The program's bottom-up, demand-driven approach led to projects focused on specific local needs across Africa. Despite this diversity, there were key areas where clusters of CCAA projects—independently and in aggregate—made especially significant contributions to adaptation knowledge. Some of these clusters were thematic, and some related to advances in methodologies. In total, the clusters indicated potentially useful areas of future research and intervention.

One area of CCAA research was clustered around issues of **human health, water and climate change.** Working on issues of water quality as well as vector-borne diseases, these projects explored the potential for reducing health vulnerabilities through improved ecosystem management.[5] These projects provided insights on the climatic and ecological mediation of some diseases, such as the impact of landscape on malaria prevalence (Githeko et al., 2011), and identified opportunities to reduce ecologically favourable conditions for the spread of disease. Projects highlighted that changing water-management practices, such as irrigation and/or the construction of small dams, had already led to increased disease burdens (such as of onchocerciasis and leishmaniasis), and that a changing climate would exacerbate current problems.

[5] Research on ecosystem approaches to human health has been supported by IDRC since the 1990s, and these projects have contributed important experiences on the integration of climate change dimensions in Ecohealth approaches.

Other projects highlighted the importance of **soil and water conservation** practices, including fertility-management options, for maintaining soil moisture and reducing the vulnerability of farmers to rainfall variability. In much of Africa, these options were already relevant, but the increasing variability and uncertainty of rainfall has increased their value. In the Maghreb, projects dealt with increasing water scarcity as a central challenge facing communities and governments. In aggregate, these North African projects indicated that institutions developed for managing surface water are not sustainable in the context of increasing reliance on mined groundwater. The complex mixtures of land-tenure rights and traditional institutions for the management of water, coupled with bureaucratic state approaches to the management of this common resource, are leading to governance failures and significant challenges for the sustainability of smallholder agriculture. Where land is privately owned and social capital is high, farmers have been able to develop new institutions and reduce water demand, but these are exceptional cases. These projects have highlighted the potential role for negotiated outcomes in some cases, and underlined the need for reform of land and water rights in others.

CCAA-supported projects on urban vulnerabilities to climate change highlighted the importance of local government and municipality services in **reducing flooding risk**. Vulnerability to flooding is disproportionately high in rapidly growing informal areas usually lacking adequate infrastructure. Yet the informality of these areas presents local governments with key policy challenges regarding their recognition and the provision of services such as the construction and maintenance of drainage, waste removal, planning and enforcement. Projects demonstrated that communicative multi-stakeholder approaches can be effective in reducing vulnerabilities, and have an important role alongside infrastructure investments.

Several projects in East, Southern and West Africa worked to increase the usability of **climate information for smallholder farmers**, including improving means of downscaling, and verifying and disseminating seasonal forecasts. They demonstrated that farmers are better able to adapt to climate change and variability when they engage with and apply climate information. However, the majority of meteorological forecasts are generated at national levels and rarely reflect or meet the needs of farmers. These projects showed how the use of multi-stakeholder platforms to gather, interpret and disseminate climate information can strengthen understanding and uptake of climate information among farmers and pastoralists. The value of these approaches and platforms is indicated by the willingness of farmers and local districts to pay for their sustainability.

Many CCAA projects highlighted the central importance of **using local knowledge** in developing sustainable options for managing climate risk. Examples included the development of alternative technologies, modifications to cropping systems, adoption of new varieties, and improving the accuracy and accessibility of climate information. CCAA projects led the way in showing how to design projects allowing for the integration of indigenous and scientific knowledge in developing adaptation options, and identified key questions for further analysis and needs for policy support.

The most common finding across all CCAA projects was the demonstrated value of developing **multi-stakeholder processes**, bringing together local communities, the private and public sectors, NGOs, academia and other R&D institutions, and extension services to share and create knowledge on adaptation. At local levels, farmer groupings and agricultural innovation systems were identified as critical— even prerequisite— platforms for learning and innovation which then facilitated adaptation action. However, the same value was also demonstrated in multi-stakeholder approaches to urban management and coastal adaptation, as well as adaptation in water management and reducing vulnerabilities in human health. These findings validate the program's hypothesis that PAR has a valuable role to play in developing sustainable adaptation solutions at local levels.

The program also made substantial contributions to the field of **monitoring and evaluating adaptation**, in addition to extensive capacity building on this topic among project teams. Three capacity-development workshops were organized for different cohorts of CCAA-supported projects between 2007 and 2009. The first of these concentrated mostly on outcome mapping (Earl et al. 2001) to allow teams to document adaptation as changes in behaviour, practices or relationships. Subsequent workshops integrated outcome mapping with other tools to contribute to a results-based management approach. The *Capacity and Toolkit Development on M&E* project was coordinated by the UN Economic Commission for Africa (UNECA) and executed with the AGRHYMET regional centre, the Observatory for the Sahara and the Sahel (OSS) and the International Union for Conservation of Nature (IUCN). This project developed training materials for a coherent set of 11 tools used to plan, monitor and evaluate adaptation initiatives.

In summary, CCAA-supported research emphasized and responded to the local nature of adaptation, but was also able to contribute to wider research problems. CCAA's bottom-up, uniquely African perspective on adaptation identified critical areas for continued work, with implications and lessons for researchers, governments and donors.

4.3 Unmasking PAR-related limitations

As discussed in Subsection 3.1, the logic of adopting PAR as the principal research approach of CCAA stemmed from an analysis of distinct but related problems. PAR was judged to be the best means for bringing researchers, policymakers, vulnerable communities and other key stakeholders together to solve adaptation challenges collectively. With its focus on participatory processes, PAR has demonstrated its value in building ownership and partnerships; strengthening adaptive capacity; and identifying, testing and implementing sustainable adaptation solutions. However, when considering the potential for PAR to be applied more widely in adaptation, it has to be acknowledged that there are limitations to PAR, both practical and theoretical.

PAR is challenging to manage, requiring additional skills to those needed in traditional research. It also requires considerable investments of time and resources by researchers— the transaction costs of PAR are high, in other words. It is also important to note that PAR represents a shift in the role of researchers from being neutral, objective observers to being actively

engaged facilitators of change. Not all researchers are comfortable with this change in role, but CCAA's experience indicates that through mentoring, trial and error, exchanges with peers, and— crucially— a desire to do so, researchers can develop the necessary skills. However, traditional research institutions may not prioritize the time and resource investment required for PAR, instead evaluating individual performance through peer-reviewed outputs of research.

Nonetheless, practical constraints experienced by CCAA projects were largely related to limits on their mandates, sources of authority and resources, rather than challenges in implementing PAR. Bringing together stakeholders as partners in research processes implies progress based on negotiation and mutual understanding, rather than being able to command and control different actors. Managing these human processes represents new challenges for researchers, particularly when individual actors are bound up with the processes of their own institutions.

In the *Water Scarcity in the Saiss Basin* project, for example, a memorandum of understanding between the project team and the director of the local Water Basin Management Agency (ABHS) was signed. ABHS would provide some equipment and technical expertise to demonstration experiments established by the research team, and would provide support to participatory processes aimed at developing social contracts for better management of water in agriculture. However, soon after the project began the ABHS director was reassigned to a different agency and his successor had different priorities and ideas, and the anticipated support did not materialize. Similarly, district officials and agricultural extension officers involved in the processes of other projects, such as *Agricultural Innovation in Tanzania and Malawi*, were rotated to new positions leaving the continued engagement of their institution dependent on their successors.

In other cases, researchers faced difficulties in managing the expectations and engagement of communities. In Malawi, within the *Agricultural Innovation in Tanzania and Malawi* project, some farmers withdrew from participating in project learning plots because the project would not provide free agricultural inputs. In Ethiopia, through the project on *Managing Risk in the Horn of Africa*, farmers expressed preferences for water-harvesting technologies with capital start-up costs that exceeded available resources and the capacities of the community. The team needed to invest considerable extra time to work with the community to work through the costs involved, and to identify options that met needs within the available resources.

In the *Moroccan Plains and Mountains Communities* project, the research team noted a strong difference of engagement between the two communities. The mountains community was highly involved in project activities, whereas the team had difficulties in encouraging members of the plains community to attend workshops and focus groups, engage in field activities, or even sometimes to answer questions during surveys. It appeared that the plains community, after 30 years of drought, had largely given up hope of finding any solutions to their problems, and felt it was up to the government to act, not them. After three years, the research team made some progress and some of their recommendations were adopted by the local council, but the

difficulties in engaging with the community clearly had impacts on opportunities for research and building adaptive capacity.

With both of these sets of challenges, the common theme was that project personnel were unable to coerce stakeholders. However, a fundamental principal of CCAA was to build ownership and to use inclusive processes to strengthen adaptive capacity— and coercion would be against these objectives. The strengths of PAR, and CCAA, were based around collaborative power to connect and mobilize others and change oneself, rather than relational power aiming to direct and control others. **The collaborative approach requires a willingness to risk failure and an acknowledgement of one's limits**; this represents a particular difficulty for governments, especially the most authoritarian.

It is important to note the limited time available to these projects— building trust, effective and lasting relationships, and sustainability into outcomes are highly challenging tasks within a three-year framework. Follow-up phases would have left project teams better able to learn from experiences and strengthen and re-orient approaches, where necessary. Over time, many of the barriers to buy-in, participation and engagement from stakeholders would be likely to decline with visibly successful projects.

Because PAR is empirical— informed and driven by observation and experimentation— each process is highly individual. One of the principal lessons from CCAA's research was that adaptation is local— meaning that specific contexts imply specific solutions— so research approaches that recognize, explore and utilize the particular circumstances of adaptation are valid. However, this creates problems for generalizing and replicating results, as required by "rigorous" science. **If PAR develops adaptation solutions that are locally specific, how do we know if they will work in other communities?** How do these results contribute to scientific knowledge, or to the ability to develop national-scale adaptation policies?

PAR has been challenged on these grounds, but workable alternatives are not readily available. For example, drip irrigation has long been identified and understood to be a workable technology capable of reducing agricultural water demand by over 90%. Despite government subsidies of up to 75% on drip-irrigation infrastructure, uptake by farmers remains low in many areas. The reasons for this lie in the social, legal and institutional processes connected with using the technology. Although the potential benefits of drip irrigation can be scientifically validated, replicated and generalized, the technology itself cannot be implemented in a vacuum. Specific barriers to adoption vary from place to place, but they include legal issues related to land ownership, access to state subsidies and permissions to dig for groundwater, socio-cultural issues related to collectivizing small-scale farmers to scales large enough for the technology to be efficient, and political and economic issues such as pricing of water. In the *Water Scarcity in the Saiss Basin* project, CCAA researchers found that barriers to entry were completely different for two communities just a few kilometres apart.

PAR's strength is to understand and negotiate solutions to these issues in a microcosm. Its most valuable results are not necessarily the new practices and technologies developed, but rather understanding how institutional solutions to their adoption can be made sustainable. In this way, PAR can create sound advice for policymakers on how to reorient public services to better support adaptation, although this will need to be applied differently in different places and contexts.

For example, CCAA-supported projects developed local institutions in Benin and Kenya for compiling and disseminating integrated seasonal forecasts and climate information, using both indigenous and modern scientific knowledge. The learning from this does not offer fixed blueprints for the precise techniques for generating combined forecasts, or for the form and structure of local institutions to disseminate this information. These will vary from place to place according to the methods used by traditional forecasters, and with the nature of government, research and community institutions. However, the CCAA projects demonstrated the developmental and scientific benefits of the approach, and allowed the formation of guidelines, recommendations and principles for those wishing to follow suit. Similarly, state organizations in Morocco can learn from the findings of the *Water Scarcity in the Saiss Basin* project to create more flexible regulations supporting the adoption of drip irrigation, and provide enhanced extension services to assist farmers.

PAR is not and cannot be a substitute for rigorous scientific enquiry that controls confounding variables to produce replicable, generalizable results. However, traditional scientific enquiry alone is not capable of producing the insights and practical achievements of PAR. Both approaches are necessary in identifying practicable solutions to climate adaptation challenges.

The CCAA model of PAR, although valuable, is not a complete and globally applicable approach to solving the adaptation challenges of every community in Africa. The significant transaction costs— and limited numbers of qualified and experienced researchers— would be prohibitive for widespread replication and scaling up. However, PAR processes can be adopted and scaled up by civil society and development organizations. State organizations can bring PAR approaches into agricultural and health extension work. Researchers can support these efforts rather than lead them, and conventional state, civil society and development programs will continue to be needed. **PAR approaches provide a complement to other public programs and can support them.**

Ultimately, PAR offers an entry point to empowering communities and citizens, and to strengthening local institutions and capacities for adaptation. With international funds for adaptation beginning to flow, as well as the recognition that local institutions and capacities are crucial for adaptation, one lesson from CCAA is that serious attention should be given to supporting relay institutions to strengthen local adaptation processes. In the absence of strong local institutions and organizations, internationally funded adaptation may well be a hit-and-miss affair, to the disadvantage of all.

4.4 Understanding emerging knowledge needs

At the close of a six-year research program, it would be unusual if the final report did not highlight a series of further questions for investigation. Each project supported by CCAA identified areas for further enquiry and development on a wide range of subjects. Rather than providing a comprehensive list of these, however, this subsection highlights three key areas for further research that were distilled from the extensive CCAA project findings.

Research supporting adaptation investment processes

One set of research questions focuses on the need to establish and support new institutions and mechanisms for financing adaptation to climate change. The Stern Review (Stern, 2006) estimated that global needs for adaptation would be $100 billion per year. At the time of writing, negotiations were underway to establish the Green Climate Fund, which would go some way towards meeting that objective.

However, global mechanisms for moving large quantities of funding from international to local levels have had mixed results in the past. The preparedness of most local institutions and organizations to access and manage external funds is extremely weak, as are relay mechanisms for moving funds from international to local levels. The sudden availability of large quantities of funding has the potential to be massively distorting, and to generate wasteful and even corrupt practices. **Research is needed to identify, propose, strengthen and inform institutions and mechanisms for adaptation funding**, particularly in terms of keeping transaction costs low and meeting the needs of vulnerable communities. Among the elements required would be research on the distorting nature of international funding with respect to national policymaking and accounts, and on the capacity of institutions to absorb, channel and use funds.

One key area is the development and refinement of prospective evaluation tools for adaptation investments. While such tools exist, more work is needed to clarify links between adaptation and poverty reduction in projecting the potential impact of projects. These in turn need to be linked to the strengthening of evaluation and adaptive capacity in recipients, so that the use of adaptation funds is accountable to local communities and national governments, as well as to international donors. Similarly, research is needed to define the limits on potential for scaling up successful pilot projects. Proposals for scaling up and replication need to be accompanied by careful analysis of initial successes, to avoid "policymaking by anecdote" leading to maladaptation in other settings.

Research into adaptation decision making

Aside from research on strengthening adaptive capacity in general, there is a need for greater understanding of how individuals and groups make specific adaptation decisions in the face of uncertainty. The experiences of CCAA researchers underline the complex nature of decision making, particularly when stakes are high and outcomes are uncertain. There is considerable work by psychological and informatics researchers on the use of information in decision making, which could be usefully extended into applied adaptation settings. Understanding how the

presentation of information influences decision making, particularly in high-stakes/low-certainty contexts, would be of great benefit to those researchers attempting to influence policy. Research to develop appropriate tools using data from different provinces and levels of certainty to support decision making would also be of value to researchers and research users.

Research is also needed to help decision makers understand and compare trade-offs between adaptation options for different stakeholders over time. Particularly for costly infrastructure investments in flood protection and sea defences, gross assessments of costs and benefits can mask inequitable distributions between different societal groups. **An important aspect for such work is the inclusion of non-market values in analyses, including cultural and political costs and benefits.** Time is another important factor, because the effectiveness of specific adaptations may change over time.

Finally, in this area, research is needed on external factors conditioning the successful engagement of policymakers in adaptation, and how to strengthen state–society interactions in adaptation decision making. It is no surprise that some organizations and governments are less open to participation than others. CCAA's Tunisian partners struggled to develop local health committees including government and community representatives, until the revolution of January 2011 changed the political landscape and created a new social dynamic. The complex and dynamic nature of climate change impacts mean that the capacities to respond to them effectively are distributed throughout different actors in society, including the private and civil sectors, requiring different forms of collaboration. The challenge here is to identify means of building such partnerships, especially in nations where the state prefers to act as the sole locus of authority and power.

Research for adaptation and rural livelihoods

Although Africa is urbanizing rapidly, the majority of the most vulnerable people on the continent remain those in rural communities. Often remote, with limited access to public and market services, and limited resilience and adaptive capacity, these communities will require dedicated support, research and investment to ensure that climate impacts do not hinder their social and economic development.

CCAA-funded research emphasized the crucial links between traditional institutions for land and water management and resilience to climate change. In areas where water scarcity is intensifying and land is being degraded, traditional institutions are coming under increasing stress. This is particularly the case where groundwater is being used in place of surface water. **The intersections between land rights, land degradation and climate impacts require further research.** In many areas of rural Africa, complex patterns and mixtures of land use and property rights already lead to resource conflicts. Large-scale agribusiness investments exploiting the continent's agricultural potential and contributing to national revenues have had negative impacts on local communities and traditional users of land. More detailed analyses are needed to

understand how these issues will synergize with the impacts of climate change, particularly in terms of land governance and transparency.

Further research is needed to improve access of smallholder farmers and local communities to markets and services. As climate change drives farmers to adopt new crops, the availability of appropriate agricultural extension advice, better market information, reduced post-harvest food losses and improved market connectivity will all be crucial in getting farmers better prices for their produce.

Research is important to identify and assess how local and/or indigenous financing mechanisms can strengthen the resilience of vulnerable communities. Offering crop insurance to smallholder farmers at economic rates remains a considerable challenge to both the private sector and the state, given the high transaction costs involved. Yet climate insurance and other forms of social and economic safety nets are crucial components of climate resilience. What is the capacity for community-scale microfinance institutions to fill the gap and cater to smallholder farmers and other community members, possibly acting as relay institutions for national funds?

Finally, there is a need to assess the costs of adaptation for smallholder farmers. With climate projections and agro-meteorological modelling, it should be possible to provide economic comparisons of required inputs per kilogram of produce yielded. This will be crucial information for developing support programs and finance mechanisms, as well as helping individual farmers to make investment decisions.

4.5 Summing up: has CCAA achieved its mandate?

So, did CCAA fulfil its mandate of building institutional and research capacity? The answer is: "Yes, mostly". It certainly underscored the importance of preparing the relevant knowledge base to enable adaptation to take root. It is too early to say whether CCAA initiated transformative change through institution building. The program's attempt to work with policymakers on a programmatic level yielded varying results. The slow pace of bureaucracy in Africa and the limited capacity in many African institutions, contributed to "policy apathy". Nonetheless, there are some tentative responses from key regional policy groups such as the African Ministerial Conference on the Environment (AMCEN), the Southern African Development Community (SADC) and Lake Victoria.

Encouraging those most affected by climate change to play a leadership role in adaptation was always central to CCAA's strategy and approach. The program consistently emphasized devolution, so that African institutions and people could manage their own environmental affairs. There were difficulties here, partly because the concept seemed foreign to many prospective organizational partners. Identifying key African partners to carry forward the legacy of CCAA was also difficult. Again, these processes represent major shifts in perception and practice, which usually require considerable time and support to achieve.

However, CCAA's legacy and its evaluation will continue to generate interest long after the end of the program. While the program did not realize all of its ambitions, it achieved most of its aims and exceeded some. It will be remembered for its ability to engage multiple actors, build research capacity and provide a social impetus to catalyse change. **CCAA represents a new way of working with researchers, providing them with a variety of tools, strategies and methods to stimulate adaptation in their own communities.** Perhaps most importantly, CCAA reminded many African researchers of the limits to traditional research methods, and that adaptation benefits from a new, bolder type of social contract with communities— giving them a more central place in the enquiry and seeking their solutions as essential to the research process. For CCAA, adaptation research meant ensuring that the drivers of the enquiry were those intended to benefit from the results.

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Annex 1-1: Key research statistics

Research Projects & Themes

CCAA funded **41** research projects and **5** knowledge sharing and capacity building projects, plus second phase funding for two of the knowledge sharing and capacity building projects (ACCFP and AfricaAdapt).[1] Research for these projects was carried out in **33** African countries[2], and projects addressed the following themes[3]:

- **26** projects addressed agriculture and rural livelihoods
- **13** projects addressed water
- **11** projects addressed urban vulnerability
- **9** projects addressed health
- **5** projects addressed coastal
- **8** projects addressed capacity building and knowledge sharing

Research Outputs

By the end of the program in March 2012, CCAA researchers had produced nearly **500** research outputs, including:

- **59** peer-reviewed research outputs[4], including:
  - **46** articles in peer-reviewed journals—**28** from research projects and **18** from knowledge sharing and capacity building projects;
  - **6** chapters in peer-reviewed edited volumes;
  - **6** published conference proceedings; and
  - **1** book
- **205** conference presentations;
- **47** theses by graduate students involved in research projects[5];
- **156** grey literature publications (including materials such as training manuals, reports, policy briefs, brochures); and
- **11** audiovisual products (such as movies and radio scripts)

[1] See Annex 1-2 for information on individual projects.
[2] Some projects operate in more than one country.
[3] Some projects address more than one theme.
[4] See Annex 1-3 for a list of peer-reviewed research outputs and copies of all peer-reviewed journal articles. Information on other categories of outputs is available upon request.
[5] This figure only includes those graduate students who had submitted their theses/major research papers by the time of writing. Other students who were still completing their studies at the time of this report are not included.

Annex 1-2: Table of Climate Change Adaptation in Africa research and knowledge sharing projects

	Project Number	Full Project Title	Shortened Title	Start Date	Status	Completion Date (Upcoming or Actual)	Funding (CAD)	Geographic Area	Lead institution	Theme(s)
1	**104139**	Evaluating the Efficacy of Radio Drama as a Means to Strengthen the Capacity of Smallholder Farmers to Adapt to Climate Change	Radio Drama to Strengthen Adaptive Capacity in Nigeria	14/05/2007	Closed	04/08/2011	$365,628	Nigeria	Developing Countries Farm Radio Network (DCFRN) **Lagos, Nigeria**	Agriculture & Rural livelihoods
2	**104140**	Lack of Resilience in African Smallholder Farming: Enhancing Adaptive Capacity of Local Communities to Pressures of Climate Change	Adaptive Capacity of Smallholder Farmers Across Africa	27/03/2007	Closed	28/02/2011	$1,319,800	Mozambique, Zambia, Zimbabwe, Uganda, Tanzania, Ghana and Mali	Department of Soil Science and Agricultural Engineering, University of Zimbabwe **Harare, Zimbabwe**	Agriculture & Rural livelihoods
3	**104141**	Strengthening Local Agricultural Innovation Systems in Less Favoured and High Potential Areas of Tanzania and Malawi	Agricultural Innovation in Tanzania and Malawi	23/03/2007	Active	23/06/2011	$1,427,909	Tanzania, Malawi	Institute of Resource Assessment (IRA), University of Dar Es Salaam **Dar es Salaam, Tanzania**	Agriculture & Rural livelihoods
4	**104142**	Strengthening the Capacity of Farmers to Reduce the Impact of Climate Change on Agricultural Productivity to Ensure Food Security and Reduce Poverty in Benin	Agriculture and Food Security in Benin	23/04/2007	Closed	24/10/2011	$698,713	Benin	Initiatives pour un Développement Intégré et Durable (IDID_ONG) **Porto Novo, Benin**	Agriculture & Rural livelihoods
5	**104143**	Vulnerability and Adaptation of Agricultural Systems in Madagascar	Agricultural Adaptation in Madagascar	11/06/2007	Closed	23/02/2011	$420,071	Madagascar	Université d'Antananarivo - École Supérieure des Sciences Agronomiques (ESSA) **Antananarivo, Madagascar**	Agriculture & Rural livelihoods
6	**104144**	Building Adaptive Capacity to Cope with Increasing Vulnerability Due to Climatic Change	Adaptive Capacity in Agriculture in Zambia and Zimbabwe	27/03/2007	Closed	22/03/2011	$1,056,404	Zambia, Zimbabwe	Ministry of Natural Resources Management and Agriculture, Midlands State University. **Gweru, Zimbabwe**	Agriculture & Rural livelihoods
7	**104146**	Managing Risk, Reducing Vulnerability and Enhancing Productivity under a Changing Climate	Managing Risk in the Horn of Africa	27/03/2007	Active	27/09/2011	$1,306,013	Tanzania, Kenya, Ethiopia, Sudan	Sokoine University of Agriculture (SUA) **Morogoro, Tanzania**	Agriculture & Rural livelihoods
8	**104150**	Managing Climate Risks for Agriculture and Water Resources Development in South Africa	Agriculture and Water in South Africa	27/03/2007	Closed	27/09/2011	$999,749	South Africa	Department of Agricultural Economics, University of the Free State (UOVS) **Bloemfontein, South Africa**	Agriculture & Rural livelihoods Water
9	**104153**	Climate Change Adaptation Mechanisms for Rural Communities in Two Contrasting Ecosystems of Morocco (plains and mountains)	Moroccan Plains and Mountains Communities	15/03/2007	Closed	28/08/2011	$294,703	Morocco	Institut National de la Recherche Agronomique (INRA) **Rabat, Morocco**	Agriculture & Rural livelihoods
	104270	Water, Health and Climate Change Adaptation in Africa		15/10/2007	Active	05/05/2016	$2,467,086			
10	**104270**	New Land, New Life West of Lake Nasser - Aswan	New Land, New Life Project	15/10/2007	Closed	05/05/2016		Egypt	Near East Foundation / Center for Development Services **Cairo, Egypt**	Water Health Agriculture & rural livelihoods

	Project Number	Full Project Title	Shortened Title	Start Date	Status	Completion Date (Upcoming or Actual)	Funding (CAD)	Geographic Area	Lead institution	Theme(s)
11	**104270**	Integrated Eco-systemic approach for optimization of small dams in Morocco: Scenarios Analysis to improve the coping capacities of communities and the resilience of ecosystems to climate changes	Small Dams in Morocco	15/10/2007	Active	05/05/2016		Morocco	Institut National de la Recherche Agronomique (INRA) **Rabat, Morocco**	Water Health Agriculture & rural livelihoods
12	**104270**	An ecosystems approach to managing water and health in the context of climate change: Adaptive strategies to drought and flooding in four West African countries	Ecosystems Approach to Water and Health in West Africa	15/10/2007	Active	05/05/2016		Côte d'Ivoire, Togo, MauritanieSénégal	Centre Suisse de Recherches Scientifiques en Côte d'Ivoire (CSRS) **Abidjan, Cote d'Ivoire**	Water Health Agriculture & rural livelihoods
13	**104270**	Adaptation to climate change and strategies to reduce the risk of water-borne illnesses in Guinea's forested zones	Water-Borne Illnesses in Guinea	15/10/2007	Active	05/05/2016		Guinea	Centre d'Études et de Recherche en Environnement, Université de Conakry **Conakry, Guinea**	Water Health
14	**104270**	Analysis of the health impacts of climate change adaptation strategies: The case of transmission of zoonotic cutaneous leishmaniasis from Leishmania major in Tunisia	Health Impacts of Climate Change in Tunisia	15/10/2007	Active	05/05/2016		Tunisia	Administered by the Agence Tunisienne de Coopération Technique and implemented by l'Observatoire des Maladies Emergentes **Tunis, Tunisia**	Water Health
15	**104270**	Eco-Health Approach to the Control of Onchocerciasis in the Volta Basin of Ghana	Eco-Health Approach in Ghana	15/10/2007	Active	05/05/2016		Ghana	Noguchi Memorial Institute for Medical Research, University of Ghana **Legon, Ghana**	Water Health
16	**104329**	Enabling Stakeholders in Moroccan Coastal Management to Develop Sustainable Climate Change Adaptation Policies and Plans	Moroccan Coastal Management	28/03/2007	Closed	15/12/2010	$896,967	Morocco	École Nationale Forestière d'Ingénieurs **Sale, Morocco**	Agriculture & Rural livelihoods Coastal
17	**104682**	Adapting Fishing Policy to Climate Change with the Aid of Scientific and Endogenous Knowledge	Fishing Policy in West Africa	18/02/2008	Closed	17/02/2012	$1,192,453	Cap Verde, Gambia, Guinea, Guinea Bissau, Mauritania and Sénégal	Environment and Development in the Third World (ENDA-TM) **Dakar, Senegal**	Coastal
18	**104683**	Rural-Urban Cooperation on Water Management in the Context of Climate Change in Burkina Faso	Rural-Urban Cooperation on Water Management in Burkina Faso	07/02/2008	Closed	24/10/2011	$513,270	Burkina Faso	Institut de l'Environnement et de Recherches Agricoles (INERA) **Ouagadougou, Burkina Faso**	Water Urban Agriculture & rural livelihoods
	104695	Advancing Capacities to Support Climate Change Adaptation through Five Pilot Projects (ACCCA) – UNITAR (Sub-Saharan Africa) Components:		10/08/2007	Closed	23/02/2011	$651,486		United Nations Institute for Training and Research (UNITAR)	
19	**104695**	Pilot Project 1: Building Capacities to Adapt to Climate Variability, Extreme Climate Events and Climate Change in Urban and Peri-Urban Areas of Ouagadougou	Urban Vulnerability in Burkina Faso	10/08/2007	Closed	23/02/2011		Burkina Faso	Institut d'applications et de Vulgarisation en Sciences **Ouagadougou, Burkina Faso**	Urban
20	**104695**	Pilot Project 2: Examining the Risks and Adaptive Strategies of Agrarian Households in Cameroon	Adaptive Strategies of Agrarian Households in Cameroon	10/08/2007	Closed	23/02/2011		Cameroon	University of Buea **Buea, Cameroon**	Agriculture & Rural livelihoods

	Project Number	Full Project Title	Shortened Title	Start Date	Status	Completion Date (Upcoming or Actual)	Funding (CAD)	Geographic Area	Lead institution	Theme(s)
21	**104695**	Pilot Project 3: Improving Decision-Making Capacity of Small Holding Farmers in Response to Climate Risk in Three Drought Prone Districts of Tigray, Northern Ethiopia	Adaptive Decision-Making in Drought Prone Districts of Tigray	10/08/2007	Closed	23/02/2011		Ethiopia	Mekelle University **Addis Ababa, Ethiopia**	Agriculture & Rural livelihoods
22	**104695**	Pilot Project 4: Improving Decision-Making Processes to address Food Security and Water Management through Climate Change Scenario Generation in the Kano Plains of Eastern Africa	Food Security and Water Management in Kenya	10/08/2007	Closed	23/02/2011		Kenya	Institute for Sustainable Commodities Kenya (ISCOM Kenya) **Nairobi, Kenya**	Agriculture & Rural livelihoods Water
23	**104695**	Pilot Project 5: Adaptation Options for the Impoverished Mshayazafe Settlement through improved Water Supply, Drainage and Sanitation	Water Management in Urban South Africa	10/08/2007	Closed	23/02/2011		South Africa	City of Durban, CSIR **Durban, South Africa**	Urban Water Health
24	**104707**	Transferring the Malaria Epidemic Prediction Model to End Users in East Africa	Malaria Epidemic Prediction in East Africa	21/08/2007	Closed	22/03/2011	$782,802	Kenya, Tanzania, Uganda	Kenyan Medical research Institute (KEMRI) **Nairobi, Kenya**	Health
25	**104752**	Pastoralist Livelihood Security: Developing Adaptive Capacity with a Focus on Nomadic Livestock Production under Climate Change	Pastoralists and Nomadic Livestock in Kenya	11/12/2007	Closed	30/09/2010	$363,369	Kenya	Intermediate Technology Development Group Ltd (known as Practical Action) **Nairobi, Kenya**	Agriculture & rural livelihoods
26	**104795**	InfoClim : Platform for Helping Vulnerable Communities Adapt to Climate Change	InfoClim	24/10/2007	Closed	21/03/2011	$439,717	Sénégal	Centre de Suivi Écologique (CSE) **Dakar, Senegal**	Agriculture & rural livelihoods
27	**104835**	Altering the Climate of Poverty under Climate Change in Sub-Saharan Africa: Setting Priorities and Strategies for Adaptation with the Forests to Climate Change	Forests in Central Africa	07/01/2008	Active	07/07/2011	$1,699,956	Democratic Republic of Congo, Central African Republic, Cameroon	Center for International Forestry Research (CIFOR) **Kinshasa, DRC**	Agriculture & rural livelihoods
28	**104898**	Community Based Adaptation to Climate Change in Africa	Community Based Adaptation in Africa (CBAA)	13/02/2008	Closed	13/02/2011	$1,398,500	Kenya, Malawi, Sudan, South Africa, Tanzania, Uganda, Zambia and Zimbabwe	African Centre for Technology Studies (ACTS) **Nairobi, Kenya**	Agriculture & rural livelihoods
29	**104903**	Integrating Indigenous Knowledge in Climate Risk Management to Support Community Based Adaptation	Integrating Indigenous Knowledge in Kenya	28/03/2008	Closed	28/09/2010	$409,200	Kenya	IGAD Climate Prediction and Application Centre (ICPAC) **Nairobi, Kenya**	Agriculture & rural livelihoods
30	**105439**	Using Demand Side Management to Adapt to Water Scarcity and Climate Change in the Saiss Basin	Water Scarcity in the Saiss Basin	03/10/2008	Closed	23/02/2012	$387,600	Morocco	Al Akhawayn University **Ifrane, Morocco**	Water Agriculture & rural livelihoods
31	**105515**	Adaptation to the Impacts of Sea Level Rise in the Nile Delta Coastal Zone	Sea Level Rise in the Nile Delta	15/12/2008	Active	15/05/2012	$710,800	Egypt	National Water Research Center; Alexandria University; Centre for Development Services **Alexandria, Egypt**	Coastal
32	**105518**	CCAA Challenge Fund: Support Fund for Local Adaptation Strategies	Challenge Fund	17/02/2009	Closed	24/10/2011	$558,400	Burkina Faso, Mali, Senegal	Innovations, Environnement et Développement en Afrique (IED) **Dakar, Senegal**	Agriculture & rural livelihoods

	Project Number	Full Project Title	Shortened Title	Start Date	Status	Completion Date (Upcoming or Actual)	Funding (CAD)	Geographic Area	Lead institution	Theme(s)
33	**105678**	Adapting to soil salinization induced by climate change in Senegal	Soil Salinization in Senegal	18/03/2009	Active	18/03/2012	$720,500	Senegal	Institut Sénégalais de recherches agricoles (ISRA) **Saint-Louis, Senegal**	Agriculture & rural livelihoods
34	**105814**	Climate Change and Human Health in Accra, Ghana	Health in Accra, Ghana	17/07/2009	Active	17/07/2012	$333,500	Ghana	Regional Institute for Population Studies, University of Ghana **Accra, Ghana**	Urban Health
35	**105815**	Protecting Cotonou's Urban Community in the Face of Climate Change	Urban Adaptation in Cotonou	12/08/2009	Active	12/08/2012	$324,600	Benin	le Centre de Recherche et d'Expertise pour le Développement Local **Cotonou, Benin**	Urban
36	**105836**	Exploring Urban-Rural Interdependence and the Impacts of Climate Change in Tanzania and Malawi	Rural-Urban Interdependence in Tanzania and Malawi	13/07/2009	Active	13/07/2012	$565,400	Malawi, Tanzania	Institute of Resource Assessment, University of Dar es Salaam **Dar es Salaam, Tanzania**	Urban Agriculture & rural livelihoods
37	**105838**	CapaSIDS: Capacity Building and Knowledge on Sustainable responses to Climate Change in small Island States	CapaSIDS	06/11/2009	Active	06/11/2012	$523,300	Cape Verde, Sao Tome & Principe	Instituto de Engenharia Meccânica, com sede em Lisboa **Lisbon, Portugal**	Urban Coastal
38	**105839**	Implications of Climate Change on Rural-Urban Interactions: the Case Study of Aba and its Region, Southeastern Nigeria	Rural-Urban Interactions in Nigeria	20/07/2009	Active	20/07/2012	$299,600	Nigeria	Nigeria Environmental Study Action Team **Ibadan, Nigeria**	Urban
39	**105868**	Sub-Saharan African Cities: A Five-City Network to Pioneer Climate Adaptation through Participatory Research and Local Action [Cape Town, Dar es Salaam, Maputo, Windhoek, Port St. Louis]	Urban Adaptation in Sub-Saharan Africa	21/07/2009	Active	21/07/2012	$485,600	Mauritius, Mozambique, Namibia, Tanzania, South Africa	the International Council for Local Environment Initiatives **Cape Town, South Africa**	Urban
40	**105869**	Managing Water in the Rural-urban Interface in Ghana and Ethiopia: the Key to Climate Change Resilient Cities	Resilient Cities	29/07/2009	Active	29/07/2012	$477,900	Ethiopia, Ghana	International Water Management Institute **Accra, Ghana**	Urban Water
41	**106002**	Strengthening the Role of Civil Society in Water Sector Governance Towards Climate Change Adaptation in Africa Cities – Durban, Maputo, Nairobi	Civil Society in Urban Water Governance	11/02/2010	Active	11/02/2013	$499,396	Kenya, Mozambique, South Africa	York University **London, Canada**	Urban Water

Capacity Building and Knowledge Sharing Projects

	Project Number	Full Project Title	Shortened Title	Start Date	Status	Completion Date (Upcoming or Actual)	Funding (CAD)	Geographic Area	Lead institution	Theme(s)
1a	**104391**	African Climate Change Fellowship Program	ACCFP	30/07/2007	Closed	28/02/2011	$1,925,430	Multiregional	The global change SysTem for Analysis, Research and Training (START) **Washington, DC**	Capacity building
1b	**106391**	Phase 2: African Climate Change Fellowship Program	ACCFP II	16/12/2010	Active	16/12/2012	$1,172,600	Multiregional	Institute of Resource Assessment (IRA), **Dar es Salaam, Tanzania**	Capacity building
2	**104779**	An experimental approach to capacity and toolkit development for monitoring and evaluation within climate change adaptation initiatives	Capacity and Toolkit Development on M&E	15/07/2009	Active	15/01/2012	$1,025,394	Multi-regional	United Nations Economic Commission for Africa (UNECA)	Monitoring and evaluation
3a	**104955**	Knowledge Sharing and Research	AfricaAdapt	31/03/2008	Closed	01/12/2011	$2,164,466	Multiregional	Institute of Development Studies (IDS) **East Sussex, UK**	Knowledge sharing
3b	**106243**	Phase II: Knowledge Sharing for Climate Change Adapatation in Africa 2010-12 and beyond	AfricaAdapt II	11/10/2010	Active	11/10/2012	$813,200	Multiregional	ENDA, **Dakar, Senegal**	Knowledge Sharing
4	**105099**	Promoting Participatory Action Research through Structured Learning on Climate Change Adaptation in Africa	Promoting PAR	04/04/2008	Closed	28/02/2011	$593,023	Multiregional	Center for International Forestry Research (CIFOR) **Jakarta, Indonesia**	Capacity building
5	**105602**	Linking African Researchers with Adaptation Policy Spaces	Linking Researchers With Policy Spaces	18/03/2009	Closed	18/03/2011	$455,874	Kenya, Malawi, Uganda	Institute of Development Studies (IDS), University of Sussex **Sussex, UK**	Research to policy processes

Eleven of these projects are grouped under two "umbrella" funding allocations made by the program in 2007–08: Advancing Capacity to Support Climate Change Adaptation: Five Pilot Projects, and Water, Health and Climate Change Adaptation in Africa, through which CCAA supports six projects.

The themes reflect those identified in CCAA's 2007 program strategy. A number of CCAA-supported projects have relevance to other important adaptation-related themes such as disaster preparedness, and climate information and forecasting methods. Forestry and pastoralism are captured under Agriculture and rural livelihoods; Health refers to those with a focus on vector or water-borne disease; Coastal includes fisheries, sea level rise, and broader coastal

Annex 1-3: Peer-reviewed journal articles resulting from Climate Change Adaptation in Africa (CCAA) research and knowledge sharing projects

From PAR Projects:

104140: Resilience and the African Smallholder: Enhancing the Capacity of Communities to Adapt to Climate Change

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104141: Strengthening Local Agricultural Innovation Systems in Less Favoured and High Potential Areas of Tanzania and Malawi

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104144: Building Adaptive Capacity to Cope with Increasing Vulnerability Due to Climatic Change

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104898: Community Based Adaptation in Africa (CBAA)

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104391: African Climate Change Fellowship Program (ACCFP)[1]

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104955: AfricaAdapt Knowledge Sharing and Research

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105602: Linking African Researchers with Adaptation Policy Spaces

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Annex 1-4: Special issue of *Climate and Development* – Abstracts of Climate Change Adaptation in Africa synthesis papers

This document includes:

- Abstracts of all papers planned for inclusion in the special issue of *Climate and* Development resulting from the synthesis efforts and mentoring process set up by CCAA. The first two groups of papers (Synthesis Papers and Individual Papers) will be submitted as a part of the special issue of *Climate and Development.* The third group includes individual papers that may not be submitted as a part of the special issue, but will receive publication advice from mentor Barry Smit.
- The proposal for the special issue of *Climate and Development*.

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Technical Experts Network (TEN) Paper Abstracts

Synthesis Paper Abstracts – For Special Issue

Drivers of climate risk in African Agriculture

Authors: Sonwa, D., Dieye, A., Majule, Mugabe, F., A., Omolo, N., Wouapi, H., El Mzourii, H., Brooks, N.

Smallholder agriculture plays an important role in African development and is highly sensitive to climate. Climate change places further stresses on already vulnerability populations. Understanding the drivers and structure of climate risks to African agriculture is a necessary prerequisite for adaptation. The Climate Change and Adaptation in Africa (CCAA) programme provided an opportunity to examine the risks faced by smallholders using field observation as well as exchange with farmers at the local level, in the context of projects characterized by Participatory Action Research (PAR) at the national level. This paper draws on the results of CCAA projects to examine the different aspects of climate-related risks in African agriculture. These projects address agriculture and pastoralism in North, Central, East, West and southern Africa and span the period 2004-2010. A framework is used in which the impacts of climate change and variability are associated with risks that in turn are viewed as functions of hazard and vulnerability. The paper examines the "social vulnerability" of populations and the "biophysical vulnerability" of natural and managed systems. Adaptive capacity is viewed as a component of vulnerability in the context of evolving risks. The paper provides a synthetic assessment of each of these aspects of risk across the different African regions, and seeks to draw lessons about risk and vulnerability in African agriculture by comparing different regional experiences.

Key worlds: African Agriculture, PAR, Adaptation, vulnerability risk, adaptive capacity.

From Action Research to Policy

Authors: Liqa Raschid-Sally, Joy OBando, with contributions from others and Ian Burton [Need to update authors].

Adaptation to existing climate change including variability and extreme events is underway (in progress) in many countries in Africa. (IPCC AR 4). Given the scenarios of continuing emissions (IPCC) and the ongoing failure of the international community to make significant progress on an agreement to make reductions of greenhouse gas emissions it is clear that the processes of adaptation are set to continue in Africa and elsewhere and will need to expand and be strengthened on a continuing basis for decades to come.

Drawing on x research studies of adaptation in y countries (see Table 1) this paper provides a synthesis of what has been learned about adaptation policy from the perspective of action research at the local level. Policy achievements and gaps, specific needs and requirements are identified. This paper does not provide a comprehensive survey of adaptation policy in Africa, but an informed and evidence base analysis based on the action research studies listed in Table
The paper is structured around 3 main questions, which address the nature of adaptation policy and who the stakeholders are, the need for adaptation practitioners to engage and the processes of such engagement. Whilst some of the CCAA projects explicitly addressed policy, many others were drawn into engagement at a policy level due to the emerging policy context around local adaptation realities. The nature of CCA is such that both mainstreaming into all relevant sectors is a requirement as well as some more centralized guidance and strategic thinking or planning. Interestingly engagement, policy formulation and policy impact are influenced by in-country political processes.

This paper presents lessons for policy makers, researchers and the donor community around the complexity and diversity of policy targets, and the need for a diversity of approaches from formal to informal and from broad participatory approaches to more personal contacts, based on an understanding of national political cultures and power structures.

Pathways to Transformational Change in the Face of Climate Impacts

Authors: Mapfumo et al. [Need to update authors]

Unprecedented climate change and variability impacts in the 21st century are likely to require transformational social, organizational, and human responses. Yet, little existing empirical work examines how decision makers can facilitate such responses to future climate impacts. Because we have not yet begun to experience extraordinary climate impacts nor indeed begun to implement or achieve commensurate adaptation responses, it may appear premature to assess how transformational outcomes can be achieved. This paper seeks to move the discussion on transformational change away from a preoccupation with outcomes and the scale of the response to the process and sustainability of adaptation interventions and the change processes they trigger. Drawing upon the conceptual literature on transformational change in organizational theory and social-ecological systems, the paper develops a framework through which to examine and assess development and adaptation interventions. It applies this framework to 8 cases of adaptation interventions sponsored by the Climate Change and Adaptation in Africa between 2005-2011. The subsequent analysis shows how a focus on change agents, generalizability of field-scale adaptation mechanisms and pathways, and sustainability of outcomes, in combination with attention to the scale and scope of change processes leads to policy-informing conclusions about the types of interventions that are likely to support transformational change to address climate impacts

Individual paper abstracts – For special issue

A Multi-stakeholder Information Platform as an Instrument for Building Capacity for Climate Change. Collaborative Design and Outcomes from InfoClim a participatory process in Senegal

Amadou Dieye and colleagues (dieye@cse.sn)
To be submitted to *Climate and Development*

Abstract

ABSTRACT. Accessing and sharing relevant information on climate change and variability is one of the challenges that limit rural livelihoods to adapt to the over changing climate conditions. Information, including meteorological and agricultural, is produced by various technical services, most of them being public institutions; although, at the farm level, access to these sources of information is very limited. How farmers, who are often illiterate and isolated, can be given greater access to relevant information that can help them to adapt their farming practices and socioeconomic strategies to climate change? To address this challenge, a project named "*InfoClim*", was designed with the aim to evaluate ways of improving access for local stakeholders, including farmers, to relevant agro-meteorological information. Infoclim has established a participatory platform, known as an "observatory", to collect, share information and provide space for social and technical co-learning. The project worked in four communities in the region of Thies in Senegal using a Participatory Action Research approach. In addition to the communities, the project committed several technical and administrative institutions, local NGOs and authorities. Final organizational structure of the observatory comprised a Forum, a Local Committee for Adaptation to Climate Change and a Regional Steering Committee. We found that participatory platforms can play an important role in sharing information. We present several case studies showing how multi-stakeholder exchange and information sharing fosters dealing with climate uncertainties. We found social co-learning and partnership between the various stakeholders crucial in helping communities to coordinate action and take joint decisions. We conclude by discussing operational problems experienced and sustainability challenge.

Engaging smallholder farmers with seasonal climate forecasts for sustainable crop production: Experience from north western Zimbabwe

Francis T. Mugabe[1,]*, Ignatious Chagonda[2] , Philip Masere[1] , John Dimes[2], Cyrial Murewi[5] and Adelaide Mundawafa[5].
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Abstract:
Semi-arid areas smallholder farmers get two to three good yields in five years because of low and erratic rainfall and are not prepared to invest in agriculture in case it turns dry. Such farmers have not been able utilize seasonal climate forecasts in making crop management decisions most of them do not have access to it, cannot interpret it or do not know how to make use of it in coming up with appropriate crop management decisions. Most of these farmers use indigenous knowledge in forecasting the coming season. Smallholder farmers in North-Western Zimbabwe were engaged with seasonal climate forecasts coupled with their indigenous knowledge systems for predicting the climate of the 2008/9 and 2009/10 season and coming up with crop management options that respond to the seasons. Meetings were held with 30 farmers from each of the two districts soon after the release of the seasonal climate forecast in September of each season. Most of the smallholder farmers were not aware of the meteorological seasonal forecast and rely on their indigenous knowledge systems for predicting the season. The farmers' predictions of the 2008/9 and 2009/10 seasonal climate were in agreement with that from the meteorological department.

After discussions with the researchers farmers were able to come up with crop management options that would respond to the forecasts which included growing of short season varieties, water harvesting, growing of drought tolerant crops, adding low levels of manure and fertilisers and frequent weeding during years that were predicted to be dry. The actual 2009/10 rainfall amounts were consistent with both the scientific and indigenous climate forecasts while the 2008/9 actual rainfall was more than what was predicted by both systems. Adding recommended amounts of fertilizers and growing long season varieties resulted in higher yields than adding half the recommended fertilizers and short season varieties in the 2009/10 wetter season while the contrary was true in the 2009/10 drier season. Frequent weeding (2 to 3 times) resulted in higher yields than weeding once in a season while water conservation technologies resulted in higher yields in the 2009/10 drier season compared to the 2008/9 wetter season. The study demonstrates that engaging farmers from release of the seasonal climate forecast through experimentation, monitoring, evaluation to harvesting makes farmers judge better the

benefits of seasonal climate forecasts in making decisions that respond to the given seasonal climate forecast.

RAPID in the Congo Basin
[working title]

Sonwa et al.,

The Congo Basin is object of high attention by the international community. One of the key characteristic of this geographical area is the presence of the Congo Watershed around the equator, which allows the maintenance of important biodiversity which the forest contributes to keep. Water is important part of the socio-economic and ecological dynamic around the Congo Basin. It may be difficult to imagine the Basin without the water cycling dynamic that contribute to maintain the ecology supporting the livelihood of communities leaving in this forest. During a science-policy dialogue, stakeholders of the region mention the importance of Water in Adaptation. The current paper present case studies reporting, (a)The trend/dynamism of climatic factors related to water cycle in some forest watershed of Cameroon, Central Africa Republic and DRC, (b) The impact of the slow modification of water cycle on livelihood activities in the Basin. We also discussed the implication of the slow modification of water cycle on development and research activities of the region. From the 3 case studies and information from the literature the 3 keys message from this paper are: (a) The forest related water cycle of the Congo Basin is not stable, there are gradually changing, (b) climate change is impacting the water cycle of the Basin, and (c) Livelihoods of populations of the Congo Basin is affected by the slow modification of the water cycle. Development and environmental action in Congo Basin need to properly take in consideration the slide modification of this water cycle in watersheds that affect products and services from forest.

Key world: Forest Hydrological cycle, Congo Basin, hydrological forest related services and products, vulnerabilities, adaptation to climate change.

Adaptation to climate change of farming systems in the region of Analanjirofo (NE of Madagascar):case study

Lilia RABEHARISOA (1), Jeannin RANAIVONASY (2) , Holy RAHARINJANAHARY (3)
(1): School of Agronomy and Isotopes Laboratory of Antananarivo
(2) and (3): School of Agronomy, University of Antananarivo, Madagascar

Abstract
School of Agronomy and Laboratory of Isotopes (University of Antananarivo) carried out CCAA Madagascar Project that was pioneer initiative for climate change adaptation in Madagascar. We carried out this research and capacity building project in four regions of Madagascar, including Analanjirofo region (NE coast of Madagascar). Based on results of participatory action research (PAR) activities, this paper aims (i) documenting changes in climate and weather conditions that farmers experience and their implication for their livelihood, (ii) identifying adaptive practices that are adopted face to new risks and constraints and (iii) identifying strategies and adaptation to future climate change, as well as role of key stakeholders in facilitating climate change adaptation. Participatory Action Research steps included building local partnership, understanding perceptions of climate change, identifying strategies for future and planning (including shared vision), and eventually implementing and monitoring planned action. Hot and humid Analanjirofo region is recognized as most exposed region to hurricanes in Madagascar. Local communities also has developed detailed knowledge on other patterns of new risks and constraints climate change generate; such patterns include less rain in drier period, earlier or later occurrence of "useful rainfalls". Cash crops, including clove trees (*Eugenia caryophyllata*) and litchi trees (*Litchi sinensis*), are seen as most threatened and vulnerable production. Climate change is raising new concerns that include decreasing productivity and quality, sustainability of systems (less time for tree crops to recover between cyclones). Adaptation practices include adoption of new rice varieties with shorter cycle or more resistive to water deficit, promotion of less sensitive cash crops (such as vanilla and pepper), new techniques in tree crops maintenance (cutting off highest branches of clove trees) and shifts in cultivation calendar. Current unfortunate national context in Madagascar emphasizes lack of efficient support from other key stakeholders, including governmental agencies and development NGOs. Farmers request better access to information and on adapted techniques, especially for resilient crops and varieties, as well as stabilized prices of cash crops.

Key words: *climate change, farming systems, cyclones, adaptation, practices, vulnerability, risks, exposure.*

Building on indigenous knowledge to strengthen the capacity of smallholder farming communities to adapt to climate change and variability in Southern Africa

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Author: p.mapfumo@cgiar.org

Abstract

Rural communities in sub-Saharan Africa are primarily dependant on rain-fed agriculture for their livelihoods and are projected to be most vulnerable to the emerging negative impacts of climate change and variability. Farmers have over the decades drawn from their indigenous knowledge systems as well as introduced technologies derived from conventional science to respond to various climatic challenges. There is, however, limited documentation of smallholder farmers' perceptions of climate change and its impacts on agriculture and how they have drawn on their indigenous knowledge to respond to the emerging challenges. A study was conducted in Makoni and Wedza smallholder farming areas in eastern Zimbabwe to investigate perceived evidence of impacts of climate change and variability and how indigenous knowledge on seasonal and long-term weather forecasting has been used by farmers to make key agricultural decisions. The study revealed community-derived evidence of increased climate variability and vulnerability in smallholder farming systems. Rainfall seasons have overally shortened by up to four weeks, resulting in declining food sources and ecosystem services, and increasing pressure on women and children as traditional roles differentially changed. Farmers' agricultural decisions are currently undermined by lack of timely availability of good quality meteorological information at local/community levels. Communities therefore depended more on indigenous knowledge and local biological and geographical indicators of seasonal forecasts to make major strategic and operational and tactical decisions on cropping, management of food stocks and enhancing social safety nets. Notably, some of the mostly biological indicators are in turn also adversely affected by increased climate variability. The study revealed opportunities to build on the strength of existing indigenous knowledge to increase farmers' consumption of climate information and enhance their capacity to adapt to climate change and variability. However, it was apparent that farmers still lack timely and reliable climate information to make strategic decisions that are likely to enhance their responsiveness to medium- to long-term climate impacts.

Key words: climate information use, food insecurity, participatory action research, poor soil fertility, rain-fed smallholder agriculture, seasonal weather forecasting

Gender, Food Insecurity and Climate Change amongst Pastoral Communities in Africa: Case Studies of Mandera and Turkana in Northern Kenya

Author: Omolo N[1]

Pastoralists earn livelihoods in the Arid and Semi-arid lands. The roles, relations, responsibilities, opportunities and constraints of pastoralists pose different challenges to women and men because of uneven access and control of resources. With few studies undertaken on the impact of climate change and its consequences, this study focuses on using quantitative and qualitative methods and a multidimensional approach to assess vulnerability in relation to food security. Using data on pastoralist's attitudes and perceptions related to climate change and variability on food security, it was found that there are changes in diet among pastoralists over the years due to climate variability and change. At the same time, the pastoralists' over-reliance on food relief has increased over the years and which has also contributed to introduction of new types of food.

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Individual Paper Abstracts – For advice from Barry Smit

The following papers are submitted by Henry Mahoo on behalf of his colleagues/students with whom he is coauthor. They may not go forward to CC&DEV but are receiving advice from Barry.

Information communication and knowledge sharing strategies for enhancing decision making that smallholder farmers use in semi arid areas.
Ayubu Churi et al.

Abstract
Crop production risk caused by climate variability can not be managed in the absence of climate information. Despite the use of various communication strategies by rural communities in Tanzania, access and use of agricultural information is inadequate to cope with challenges in crop production. This paper aims at assessing farmers information needs, evaluate effectiveness of communication strategies used and hence recommend information and knowledge sharing strategies for improved decision making. In addition, the study examined how modern ICT used together with tradition methods can reduce risks and improve crop productivity of smallholder farmers. Questionnaires, interviews and focus group discussion were used to collected primary data from farmers, extension workers and input suppliers. Data were analyzed for descriptive analysis. The findings showed that smallholder farmers need climate, market and agricultural inputs information to make strategic and tactical farm level decisions in response to climate variability. Climate information was noted to be very important factor for making strategic and tactical decisions. However, in some village farmers' crop production goals for household food security underway the need and use of climate information for small level decisions. Communicating climate information through radio was popular to farmers in this area. In addition, respondents used extension officers and fellow farmers to access climate, market and agricultural inputs information. Mobile phones were noted to be preferred by surveyed farmers for communicating agricultural information.

Analysis of Climate Risks in Crop Production in the Central Rift Valley areas of Ethiopia

1.Hirut Getachew
2. Dr. Kindie Tesfaye
3. Prof. Henry Mahoo

The study involved analysis of rainfall and temperature historical climate data on climate variability and change trends at four sites (Meki, Melkassa, Miesso and Ziway) in Central Rift Valley of Ethiopia. The results showed the existence of high interannual rainfall variability within season and sites, and a decreasing trend of rainfall at Meki, an increasing trend at Melkassa and lack of trend at Miesso and Ziway. The number of rainy days exhibited declining trend at Meki (in both belg and kiremt seasons) and at Melkassa (in the belg season) while an increasing trend had been observed at Miesso and Ziway in the kiremt season and no change in trend in the belg season at both sites. Minimum and maximum temperature showed increasing trend at Miesso and Ziway whereas no change was observed at Melkassa. As opposed to the cessation of the rainfall, the date of onset of rainfall was highly variable at all sites. The median length of growing period (LGP) was found to be 101, 88, 118 and 104 days at Meki, Melkassa, Miesso and Ziway, respectively. The chance of dry spells longer than 20 days from March to September was below 10% at all sites while the chance of dry spells longer than 5 days remain above 50% for all sites except Melkassa.

Efficacy of Recommended Agronomic Adaptation Strategies in Reducing Risks Associated With Climate Variability in Dry-Land Areas

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[1]Institute of Rural Development Planning, P.O.Box 138, Dodoma, e-mail: shaurit@yahoo.com, Cell-phone: +255 719 113 646/+255 754 757 525, [2]Soil-Water Management Research Group (SWMRG) Sokoine University of Agriculture, P.O.Box 3003, Morogoro, e-mail: swmrg2009@yahoo.co.uk, Phone:

Key words: Adaptation strategies, Climate change, efficacy.

ABSTRACT: The thrust of this study emanates from threat of ongoing global weather changes which, as a result climate variability is rapid and devastating to smallholder farmers' productivity especially those who rely completely on rain-fed agriculture. Over the centuries these smallholder farmers have developed indigenous knowledge and techniques to adapt to those climate changes. However, most of them are focusing on fighting water deficit and farmland management practices without empirical evaluation of their risk reduction efficacy and associated economic benefits. The study assessed risk reduction efficacy of adaptation strategies under climate variability in dry-land farming system in Tanzania. Data were collected from a sample of 150 farming households via structured questionnaire survey instrument, in five villages located in the upland, midland and lowland areas of Same district of Northern Tanzania along in the Pangani river basin. Statistical packages SPSS 12.0 and FRONTIER 4.1 were used for descriptive and quantitative data analyses and technical efficiency (stochastic frontier model) of agronomic management strategies, respectively. Findings revealed that the mean efficiency of maize production was low; therefore there is a possibility of farmers to increase efficiency of these strategies. Also proper use of combined strategies increases the efficiency apart from only use of single strategy. It was recommended that due to limited cultivation land in upland villages, profit maximization in this area can be made by increasing efficiency of different agronomic strategies rather expansion of cultivating land. However, in the other zones (i.e. mid and low villages) both approaches can be used. Moreover, the use of combined agronomic strategies should be location based with topographical parameters and socio-economic factors perspective.

Enhancing capacities of individuals, institutions and organizations to adapt to climate change in agricultural sector using innovation system approaches in Tanzania and Malawi.

Majule, A,E[1], T. Stathers[2]., R.Lamboll[2]., E.T, Liwenga[1] and M. Kallanda-Sabola[3]
[1]**Corresponding author***:* Institute of Resource Assessment (IRA), University of Dar es Salaam, P.O Box 35097, Dar es salaam, Tanzania. E-mail: amajule@ira.udsm.ac.tz;
[2]University of Greenwich, Natural Resources Institute; United Kingdom; [3]University of Malawi, Chancellor College, Department of Language and Communication, Box 280, Zomba, Malawi.

ABSTRACT

Smallholder agriculture underpins most rural livelihoods and national economy in Tanzania and Malawi. Agricultural production by small holders in such countries is frustrated by several factors including climate change and variability (CC&V). Non agriculture community livelihoods activities and ecosystems are also negatively affected adding costs to adaptation. The overall objective of the paper is sharing research experience on how climate change adaptation within agriculture sector can be strengthened using innovation approaches. Findings are based on a four years action research project funded by DFID through IDRC implemented in Tanzania and Malawi. A total of 16 villages, 8 each in Tanzania and Malawi were involved and a Participatory Action Research was used. In total 360 farmers were initially involved in the project. Findings showed thas CC&V is affecting farming communities, institutions and organizations differently. Communities could better adapt if relevant information on climate and required products by them reaches on time. Behaviour changes of different boundary partners in particular farmers, extension workers, agricultural based NGOs, stockists, media, with policy support (at both national and local levels) positively reduced vulnerabilities to CC&V whereby sorghum, maize, beans and sunflower crop yields improved. For local innovation systems to work better a collective mobilisation of resources and collaboration of different boundary partners is required in this context. Adaptation program should focus more in supporting action oriented research or programs if capacity to adapt need to be strengthened in agricultural sector using innovative approaches.

CCAA Technical Experts Network – Proposal for Special Issue of *Climate and Development*

1. Special Issue working title: "The effectiveness of research for strengthening climate change adaptive capacity at national and local levels in Africa."

2. Guest editor name/s, affiliation/s, contact details and one para biography
Dr. Simon Anderson – Head of Climate Change Group at the International Institute for Environment and Development. Previously Climate Change Research Manager and Evaluation Adviser at the UK Department for International Development; and, Principal Research Fellow, Centre for Poverty Reductions and Development, Imperial College, University of London.
Dr. Fatima Denton – Director of the Climate Change Adaptation in Africa programme. She joined the International Development Research Centre (IDRC) in August 2006 as team leader. Prior to joining IDRC, Fatima worked for the UNEP Risoe Centre in Denmark where she worked as a senior scientist on energy and poverty issues. Fatima has also worked with the Energy Programme of Enda Tiers Monde in Senegal as Programme Manager. During her period with Enda Tiers Monde, her research covered questions on sustainable development, vulnerability and adaptation as well as food security, local governance, water and energy poverty in the Sahel. Fatima has authored several peer reviewed articles on energy poverty, gender and energy and climate change adaptation. Fatima is Co-ordinating Lead Author (CLA) for the IPCC Working Group 2, and also Lead Author (LA) for the IPCC Special Report on Renewable Energy and Climate Change Mitigation (SREEN). She has served on several steering and scientific committees including UNEP's Scientific and Technical Advisory Panel (STAP). She holds a PhD in Political Science and Development Studies from the University of Birmingham, U.K.

3. Background and Objective
Why would collecting the proposed papers together in a special issue make the issue more than the sum of its parts?

– **The need for an SSI on research effectiveness for adaptive capacity**
The literature on climate change adaptation is growing rapidly. Since 2000, at least 300 articles a year have been published on adaptation in ISI listed journals, of which over 40% have been published since 2006 (Barnett, 2010). This proliferation of adaptation research begs the question of how effectively does it contribute to adaptive capacity. Very little evidence on adaptation research effectiveness is published.

Effective adaptation research should explore and analyze actual adaptation action, and adaptation policy processes and mechanisms of adaptive decision-making (Ford et al, 2011). "Effectiveness" is understood here as the *utility* and *influence* of research in

informing adaptive decision-making across scales, acknowledging the diversity of goals and approaches adopted by different types of adaptation support.

In relation to research on adaptation action, Ford et al (2011) conducted an extensive review of peer-reviewed, English-language literature on adaptation published between 2006 and 2009. The authors noted that the majority of studies reported on vulnerability assessments and adaptation in natural systems. Less than five percent of papers (87 of 1,741 documents) dealt with adaptation actions. Of the 87 papers, "proactive adaptation" in developed countries was the most commonly researched response. There was limited reporting on adaptive actions to take advantage of climate change, or adaptation by vulnerable groups e.g. women, elderly, or children (ibid).

Apparently, there is even less evidence being generated on research and adaptation policy processes. For example, Eakin and Patt (2011) show that in a review of selected adaptation case studies, most cases of adaptation planning borrowed little from adaptation research. Further, while the concept of resilience is increasingly entering research discourse, there is almost no evidence of the implementation of this concept through adaptation policy and practice (ibid). The authors suggest that the lack of science-policy interface in adaptation planning is particularly acute in developing countries, where adaptation is most likely to impact on the climate vulnerable populations who will gain the least from business-as-usual approaches to planning and decision-making. As the authors note,

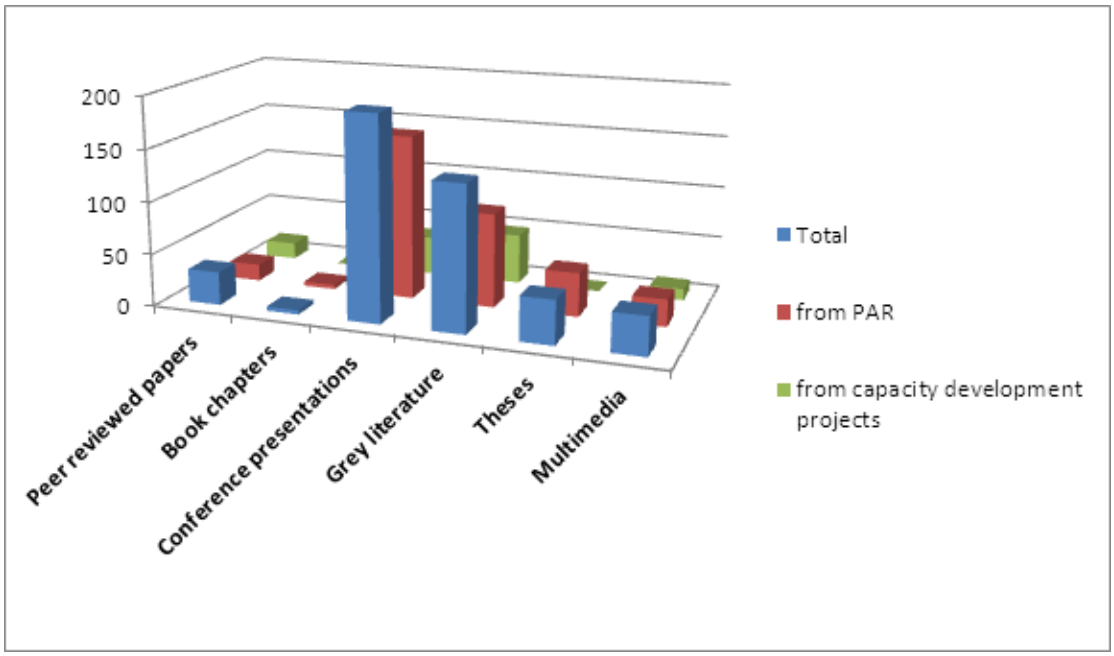
> "science–society partnerships in adaptation are not guaranteed to address the needs of the most vulnerable populations. Here the lessons from vulnerability assessments and research on barriers to adaptive capacity are particularly relevant, but as yet less apparent in existing adaptation plans."

– **How the CCAA programme addresses these gaps**

The Climate Change Adaptation in Africa (CCAA) programme is a five year research programme that has generated significant evidence related to the gaps in the literature identified above. CCAA has generated a vast information resource on adaptation, covering different sectors, scales, adaptation actions and policy processes. This information has been communicated through a variety of mediums including a significant number of influential conference papers, and a smaller but expanding number of peer reviewed articles on targeted at sector-specific journals (see graph 1, below).

Graph 1: CCAA communication outputs to date[2]

[2] "PAR" refers to a specific selection of CCAA projects that have focused on "Participatory Action Research for climate change adaptation by small-holder farmers".



This Supplementary Special Issue will bring together a selection of unpublished empirical evidence developed through CCAA projects and researchers. The evidence is being selected based on:

– Projects that generate evidence on adaptation actions
– Projects that are challenging "myths" and convention
– Projects exploring policy pathways
– Projects that can leverage research results

The Special Issue will draw on the innovative research emerging from the CCAA programme and focus on the theme of how effectively research contributes to African adaptive capacity at national and local levels. The papers included in the Special Issue will be authored by CCAA "frontrunners" – CCAA researchers who have been identified as leaders in their field, with a strong track-record of publishing both peer and non-peer reviewed outputs. The production of each paper is being mentored by one of four leading climate change scientists, each of whom is either a current or past IPCC author. The mentors will play a key role in guiding and reviewing pre-submission papers to ensure a high standard of output, but authorship of the papers will belong solely to the CCAA researchers.

The papers presented in the special issue will focus on the two sides of policy-response linkages identified in recent literature reviews as lacking in adaptation research - adaptation actions, and second, policy influence.

– **The structure/themes of the Special Issue**

Bridging the gap between "adaptation action" and "policy influence" requires that adaptation research meets the information needs of decision-makers. Second, mechanisms need to be considered for ensuring the responsiveness of adaptation policy

pathways to adaptation research. This Special Issue targets both of these areas and brings them together.

The Special Issue is structured around the two key areas of adaptation planning that require evidence around adaptation action: "Climate risk assessment" (including vulnerability assessment); and "Climate risk response". Under each of these areas, a mixture of "synthesis papers" that bring together findings from several CCAA projects, and "project papers" that focus on the findings of a single project, will be included.

Under "Climate risk assessment", the first section of the Special Issue will explore "Drivers of change" that underpin climate risks. This is in response to the gap identified in the literature review around the role of social vulnerability and adaptive capacity in driving climate risk. The majority of literature generated to date has focused on the role of biophysical impacts in determining risk. This section of the special issue will explore how the human elements of systems interact with and define the risks presented by climate change, and why solutions need to be informed by this type of information.

The Drivers of Change section will include a synthesis paper drawing on case study material from five CCAA projects that focuses specifically on the drivers of change in African agriculture (including pastoralism). This paper will look at how changes in climate-related vulnerability are affected and produced, and what these changes mean adaptive decision-making. The paper will synthesize insights and results from different CCAA projects related to climate change hazards, the impacts of those hazards, social and biophysical vulnerability factors, and factors related to adaptive capacity. Two "project papers" will also be included in this section. The first focuses on the under-researched area[3] of climate change risk in urban areas. The second paper adds to the scant empirically-based literature around climate change and conflict, which until now has largely been theoretical. [4]

"Climate risk responses" are divided into two sections. First, a section on "planning for transformational change". This theme responds to the understanding that future climate change impacts are likely to be unprecedented in nature, intensity and scope, so human and social responses to these impacts may also therefore have to be transformational.[5] This section will be represented by one synthesis paper that reviews and brings together evidence from different examples of social responses to climate impacts in the CCAA programme. The analysis will help advance existing understandings of transformation in climate adaptation in three ways: 1) it empirically elaborates the nature and scope of what makes for transformation responses to climate threats; 2) it provides evidence to illustrate and anchor conceptual and theoretical writings on responses to climate impacts; and 3) it identifies some of conditions under which transformational responses are more likely to be equitable in their distributive implications.

[3] Bicknell J, Dodman D, Satterthwaite D (eds) (2009). *Adapting Cities to Climate Change: Understanding and Addressing the Development Challenges*. London, Earthscan.

[4] Brauch, H.G. 2011. Coping with Global Environmental Change, Disasters and Security. Springer.

[5] See Pelling, 2010, "Adaptation to Climate Change". Routledge.

The second section under "risk responses" examines science-policy interfaces, focusing on the mechanisms for getting science into policy, including the politics of adaptive decision-making and policy implementation in different contexts. This will explore the implications of CCAA research for the development of climate change risk management, institutional arrangements for policy, and project experiences of the risk/policy interface. Two papers will be included that provide empirical evidence around the links between research, practice, and policy. The first is a synthesis paper around "opportunities and challenges for climate change policy". The synthesis paper draws on three case studies describing the response processes in different cases to particular hazards, including research and existing knowledge, and the engagement process of decision-making stakeholders including policy makers. The second paper will be a project paper drawing on evidence from a CCAA project using agro-meteorological data to inform policy and institutions in supporting adaptation for small-holder farmers.

Finally, a third section of the Special Issue is reserved for a set of project papers addressing the overarching theme of research effectiveness for building adaptive capacity more broadly. These papers will provide the reader with detailed case studies that cover a range of issues related to methodologies for research into adaptive capacity; the use of different types of knowledge in adaptive decision-making across scales; and the role of research in adaptive institution building and strengthening.

Introductory and concluding papers will be prepared. The first will set out what the CCA tried to achieve including the programme's theory of change. The concluding paper will assess the CCAA contribution to evidence for policy making – CCAA tested in various ways the hypothesis that research can do this. It will also assess the level of return on research investment.

4. Proposed contributions – contents list

Title	**Authors**[6]
Introduction **How can research inform, support and trigger innovation in climate change adaptation at local and national levels?**	Simon Anderson, Fatima Denton, Jessica Ayers, Arun Agrawal, Nick Brooks, Ian Burton, Barry Smit[7]
Section 1: Drivers of Change	
Synthesis paper: Drivers of change in African agriculture	Sonwa, D. et al.,
Project paper: Risk and urban	*Raschid-Sally, L. et al.*
Project paper: Climate change and conflict	Mapfumo, P. et al.
Section 2: Risk responses	
Synthesis paper: Planning for transformational change	Mapfumo, P. et al.,
Synthesis paper: Opportunities & challenges for climate change policy	*Raschid-Sally, L. et al.*

[6] In some cases only lead authors are listed.

[7] Arun Argrawal, Nick Brooks, Ian Burton, and Barry Smit are the mentors to the CCAA researchers during the development of SI papers.

Project paper: Policy and institutions for agro-met services for small holder farmers	Mahoo , H. et al.,
Section 3: Case studies of research effectiveness for building adaptive capacity **[3 or 4 papers will be selected from the following]**	
Local Perceptions on Climate Change: Impacts, Vulnerabilities and Adaptations in Tanzania and Malawi	Majule, A. et al.
Opportunities for Capacity Building for Adaptation: The Role of PAR in Tanzania and Malawi.	Majule, A. et al.
Integrating Indigenous Knowledge for Community Adaptation to Climate Change: The case of Nganyi in Western Kenya.	Onyango, M. et al.
Participatory Action Research to Improve Knowledge of Rural Communities on Vulnerability and Adaptation to Climate Change of Agrarian Systems of Madagascar.	Rabeharisoa, L. et al.
Dynamic Vulnerability and Adaptation in Arid Areas: the case of cropping systems in Morocco.	El Mzouri, E. et al.
A Multi-stakeholder Information Platform as an Instrument for Building Capacity for Climate Change.	Dieye, A. et al.
Managing Risk associated with Climate Variability and its Potential Contribution to Adapting to Climate Change.	Rao, K.P.C. et al.
Capturing Climate Change in Integrated Urban Water Resource Management: Accra and Addis.	Raschid-Sally, L.
Integrated Soil Fertility Management as an entry-point to Climate Change Adaptations in African Smallholder Farming Systems.	Mapfumo, P. et al.
Engaging Smallholder Farmers with Seasonal Climate Forecasts for the Development of Crop Management Practices.	Themba, F. et al.
Conclusion **The effectiveness of research in strengthening climate change adaptative capacity in African contexts.**	Simon Anderson, Fatima Denton, Jessica Ayers, Arun Agrawal, Nick Brooks, Ian Burton, Barry Smit[8]

5. Any other issues
N/A

[8] Arun Argrawal, Nick Brooks, Ian Burton, and Barry Smit are the mentors to the CCAA researchers during the development of SI papers.

References

Barnett, 2010 [SG to add]

Bicknell J, Dodman D, Satterthwaite D (eds) (2009). *Adapting Cities to Climate Change: Understanding and Addressing the Development Challenges*. London, Earthscan.

Brauch, H.G. 2011. Coping with Global Environmental Change, Disasters and Security. Springer.

Eakin, H.C., and Patt, A., 2011. Are adaptation studies effective, and what can enhance their practical impact? *Wires Climate Change* Volume 2, March/April 2011.

Ford et al, 2011 [SG to add]

Pelling, 2010, "Adaptation to Climate Change". Routledge.

Annex 1-5: Participatory Action Research (PAR) for Agricultural Adaptation

PAR Guides (French and English)

English: Application of participatory action research to climate change adaptation in Africa : a reference guide | French: L'application de la recherche-action participative à l'adaptation aux changements climatiques en Afrique : Manuel de référence
German, L. A., Tiani, A., Daoudi, A., Maravanyika, T.M., Chuma, E., 2012.

Fact Sheets

Enhancing smallholders' capacity to cope with climate change : participatory action research and integrated soil fertility management
Mapfumo, P., Adjei-Nsiah, S., Mahoo, H., Majule, A., 2012

Enhancing smallhoders' capacity to cope with climate change : use of seasonal climate forecasts
Mugabe, F. T., Admassu, H., Sall, A., Omolo, N. A., Honkponou, S., 2012

Country Briefs

Benin : agro-meteorological early warning to reduce agricultural vulnerability to climate change; the experiences of PARBCC in Benin
Hounkponou, S., Ahounou, M., Ahimihoue, P., Nouatin, G., 2010.

Benin : how can political and administrative authorities contribute to local community adaptation to climate change in Benin?
Hounkponou, S.; Houssou-Goe, S.; Gnangassi, C.;Ahounou, M., 2010

Burkina Faso : using participatory testing to build capacity for climate change adaptation in Burkina Faso
Bonkoungou, J.; Kobyagda, I.; Daoudi, A.; Sinon, H.;Rabdo, A., 2010

Central Africa : the effects of climate change in the Congo Basin; the need to support local adaptive capacity
Bele, Y.; Mulotwa, E.; Bokoto de Semboli, B.; Sonwa, D.; Tiani, A.M., 2010

Kenya : improving farmer adaptive capacity by integrating local and indigenous knowledge in climate forecasting and adaptive response
Ndegwa, W.; Rao, K.P.C.; Ngugi, R.K.; Kwena, K., 2010

Madagascar : adapting to cyclones in Madagascar's Analanjirofo region
Alizany, N.; Chrysostôme Rakotondravelo, J.; Rabarijohn, R.; Raharinjanahary, H.; Rabeharisoa, L.; Ranaivonasy, J.; Tiani, A.M., 2010

Madagascar : adaptive options for growing atriatry rice in the context of climate change : the case of Marovoay
Alizany, N.*;* Chrysostôme Rakotondravelo, J.*;*Rabarijohn, R.*;* Raharinjanahary, H.*;* Rabeharisoa, L.*;*Ranaivonasy, J.*;* Tiani, A.M., 2010

Senegal : a regional observatory for producers' climate change adaptation in Thies, Senegal
Bèye, G.*;* Sall, A.*;* Thiao, I.P., 2010

Zimbabwe : mobilizing local safety nets for enhanced adaptive capacity to climate change and variability in Zimbabwe
Mapfumo, P.*;* Mtambanengwe, F.*;* Chikowo, R., 2010

Annex 2-1: Key capacity building statistics

Capacity Built Through Research Projects

Climate Change Adaptation in Africa's (CCAA) **46** research, capacity building and knowledge sharing projects involved **244** organizations in their implementation.[1] Among them:

- **87%** of were African; and
- **39** of **44** lead institutions were African.

Through participation in CCAA research projects, **47** students submitted graduate theses/major research papers. Others were involved in research projects but had not yet submitted theses at the time this report was written.

Conference Support Fund

Through a Conference Support Fund, CCAA supported: [2]

- **44** individuals to attend adaptation-related conferences in 2007-2008
- **28** conferences attended by **2874+** participants from 2008-2010.

Capacity Development Workshops

CCAA supported the organization of **14** training workshops on crosscutting topics research teams, which were attended by **469+** CCAA researchers[3]. These workshops were in addition to any training workshops organized by individual project teams. The workshops addressed **7** different topics:

- **3** on Integrated Climate Risk Assessment
- **3** on Gender Analysis
- **2** on Participatory Action Research Methodology
- **2** on Proposal Development
- **2** on Monitoring and Evaluation
- **1** on Project Management
- **1** on Research to Policy Linkages

CCAA also funded **2** demand-driven workshops – one for the African Development Bank and another for researchers from Lusophone countries.

[1] See Annex 2-2 for a complete list of organizations involved in CCCA projects.
[2] See Annex 2-4 for a complete list of conferences and conference participants supported.
[3] See Annex 2-3 for a complete list of workshops organized by CCAA.

African Climate Change Fellowship Program[4]

In *phase one* of the ACCFP, the program received **281** applications – **152** English and **129** French.

A total of **45** fellowships were awarded:

- **16** Policy fellowships
- **3** Teaching fellowships
- **13** Doctoral fellowships
- **13** Post-doctoral fellowships

These phase one Fellowships took place at **24** host institutions, and by March 2012, these Fellows had produced the following:

- **14** peer-reviewed publications
- **153** presentations at **33** conferences and events

In *phase two* of the ACCFP, the program received **81** applications for a first round of fellowships and awarded **23** fellowships:

- **9** Policy fellowships
- **14** Science fellowships

A call for applications for a second round of fellowships was under way at the time of writing of this report.

[4] Statistics are based on ACCFP technical reports. See Annex 2-5 for profiles of ACCFP Fellows.

Annex 2-2: Organizations involved in Climate Change Adaptation in Africa projects

Project Number	Full Project Title	Geographic Area	Lead institution	Collaborating Institutions	Participating Institutions	Project Leader
104139	Evaluating the Efficacy of Radio Drama as a Means to Strengthen the Capacity of Smallholder Farmers to Adapt to Climate Change	Nigeria	Developing Countries Farm Radio Network (DCFRN), **Lagos, Nigeria**	Developing Countries Farm Radio Network (DCFRN), Ottawa, Ontario	Women Farmers Advancement Network (WOFAN), **Kano, Nigeria** School of Environmental Design and Rural Development, University of Guelph	Phido, Alison Data
104140	Lack of Resilience in African Smallholder Farming: Enhancing Adaptive Capacity of Local Communities to Pressures of Climate Change	Mozambique, Zambia, Zimbabwe, Uganda, Tanzania, Ghana and Mali	Department of Soil Science and Agricultural Engineering, University of Zimbabwe, **Harare, Zimbabwe**	Wageningen University and Research Centre (WUR) - Department of Plant Sciences (Plant production systems chair group) **- Netherlands**	Soil Fertility Consortium for Southern Africa (SOFECSA) - CIMMYT (International Maize and Wheat Improvement Center) Tropical Soil Biology and Fertility Institute of CIAT (TSBF-CIAT), **Kenya** Agrarian Research Institute of Mozambique (IIAM) Institute d'Economie Rurale (IER), **Mali** National Agricultural Research Organisation (NARO), Kawanda Agricultural Research Institute, **Uganda** Lake Zone Agricultural Research and Development Institute, **Tanzania** Soil Research institute, Kumasi, **Ghana** Zambia Agricultural Research Institute, **Zambia**	Dr. Paul Mapfumo
104141	Strengthening Local Agricultural Innovation Systems in Less Favoured and High Potential Areas of Tanzania and Malawi	Tanzania, Malawi	Institute of Resource Assessment (IRA), University of Dar Es Salaam, **Dar es Salaam, Tanzania**	Natural Resources and Environment Centre (NAREC), University of Malawi Natural Resources Institute (NRI), University of Greenwich, **Uk**	Institute Africain pour le developpement economique et social (INADES), Formation Tanzania, **Dodoma, Tanzania - NGO** Uyole Agricultural Research Institute (ARI), **Mbeya, Tanzania** Department of Extension Office (DEO) **Iringa and Dodoma Regions, Tanzania** Farm Inputs Promotions (FIPS) Africa Ltd, **Arusha, Tanzania** Department of Agricultural Extension and Technology, **Lilongwe, Malawi** Department of Crop Science, Bunda College, **Lilongwe, Malawi** Department of Environmental Affairs, **Lilongwe, Malawi** Mineral and Appropriate Technology Applicable to Malawi (MATAMA), **Lilongwe, Malawi**	Dr. Amos Majule
104142	Strengthening the Capacity of Farmers to Reduce the Impact of Climate Change on Agricultural Productivity to Ensure Food Security and Reduce Poverty in Benin	Benin	Initiatives pour un Développement Intégré et Durable (IDID_ONG), **Porto Novo, Benin**		Groupe de Recherche et d'Appui aux Initiatives de Base pour un developpment durable (GRAIB) Jeunesse Environnement Solidarité sans Frontière - Centre International d'Initiatives pour le Développement Économique et Social (JESSF-CIDES) Institut National des Recherches Agricoles de Bénin (INRAB) Faculté d'Agronomie de l'Université de Parakou	Saïd H. Hounkponou and Mathias Dotou Ahounou
104143	Vulnerability and Adaptation of Agricultural Systems in Madagascar	Madagascar	Université d'Antananarivo - École Supérieure des Sciences Agronomiques (ESSA), **Antananarivo, Madagascar**		Laboratoire des Radio-Isotopes en partenariat avec IRD UR SeqBio FOFIFA- Département Recherche et Développement Ecole Supérieure des Sciences Agronomiques - Département des Eaux et Forêts Ministère de l'Environnement, des Eaux et Forêts – Programme d'Adaptation National aux changements climatiques (PANA)	Lilia Rabeharisoa
104144	Building Adaptive Capacity to Cope with Increasing Vulnerability Due to Climatic Change	Zambia, Zimbabwe	Ministry of Natural Resources Management and Agriculture, Midlands State University, **Gweru, Zimbabwe**	International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)**, Zimbabwe** Centro Internacional de Agricultura Tropical (CIAT-TSBF)**, Zimbabwe** Zambian Meteorological Office (ZMDS) Zambian Agricultural research institute (ZARI) Australian Commonwealth Scientific and Research Organization (CSIRO) Sustainable Ecosystems	Matabeleland North Provincial Department of Agricultural Extension and Research (AREX), **Zimbabwe** University of Zambia Zambia Southern Province Deparment of Agriculture Drought Monitoring Centre (DMC), **Harare** CARE International World Vison Leat Trust Dunavant Agriculture Support Programme (ASP), **Zambia** Programme Against Malnutriton (PAM), **Zambia** Golden Valley Agriculture Research Trust (GART), **Zambia**	Prof. Francis Themba Mugabe

Project Number	Full Project Title	Geographic Area	Lead institution	Collaborating Institutions	Participating Institutions	Project Leader
104146	Managing Risk, Reducing Vulnerability and Enhancing Productivity under a Changing Climate	Tanzania, Kenya, Ethiopia, Sudan	Sokoine University of Agriculture (SUA), **Morogoro, Tanzania**		Tanzania Meteorological Agency (TMA), **Tanzania** University of Nairobi (UoN), **Nairobi, Kenya** Kenya Meteorological Department (KMD), **Nairobi, Kenya** Ethiopian Institute of Agricultural Research (EIAR), **Addis Ababa, Ethiopia** National Meteorological Agency (NMA), **Addis Ababa, Ethiopia** Sudan Meteorological Authority (SMA), **Sudan** Agricultural Research Corporation (ARC), **Sudan** Soil and Water Management Research Network (SWMnet) of **ASARECA, Nairobi** International Crops Research Istitute for the Semi-arid Tropics (ICRISAT), ESA office, **Nairobi**	Prof Henry Fatael Mahoo
104150	Managing Climate Risks for Agriculture and Water Resources Development in South Africa	South Africa	Department of Agricultural Economics, University of the Free State (UOVS), **Bloemfontein, South Africa**		University of Cape Town: Department of Environmental and Geographical Science Climate Systems Analysis Group (CSAG) UNEP-RISoe Center (URC) on engery, climate and sustainable development International Research Insititute for Climate and Society, Columbia University (IRI) National Center for Atmospheric Research (NCAR) School of Bioresources Engineering and Environmental Hydrology, **University of Kwazulu-Natal**	Dr. Daniel Barend Louw
104153	Climate Change Adaptation Mechanisms for Rural Communities in Two Contrasting Ecosystems of Morocco (plains and mountains)	Morocco	Institut National de la Recherche Agronomique (INRA), **Rabat, Morocco**		Hassan II University, Mohammadia, Faculty of letters and Human Sciences (Geography) Climagrhyd-Consult, consulting agency for Climate studies	Abdelouahid CHRIYAA
104270	Water, Health and Climate Change Adaptation in Africa					
	New Land, New Life West of Lake Nasser - Aswan	Egypt	Near East Foundation / Center for Development Services, **Cairo, Egypt**		High Dam Lake Development Authority South Valley University, **Egypt** Aswan Tropical Medicine Hospital - Dr. Mohamed Ebrahim Ministry of State for Environmental Affairs Agricultural Research Center	Amira Mohamed and Ahmad Farouk
	Integrated Eco-systemic approach for optimization of small dams in Morocco: Scenarios Analysis to improve the coping capacities of communities and the resilience of ecosystems to climate changes	Morocco	Institut National de la Recherche Agronomique (INRA), **Rabat, Morocco**		Institut National d'Hygiène Maroc Délégations Provinciales de la santé Chtouka Ait Baha, **Taroudant et Essaouira** ONG: Migration & Développement Maroc ; Association Tarik Ibn Zyad ; Associations de Développement Local (ADL) Association Marocaine du Journalisme Environnemental Agence du Bassin Hydraulique –Souss Massa (ABH-SM) **Agadir Maroc** Direction Régional des Eaux et Forêts Agadir Directions Provinciales de l'Agriculture, **Agadir et Essaouira** Université Ibn Zohr Agadir : faculté des sciences, faculté des sciences humaines Conseil Régional Souss Massa Draa Communes rurales Aouganz, **Askaoun et Smimou** Ciment du Maroc	Aitlhaj Abderrahmane
	An ecosystems approach to managing water and health in the context of climate change: Adaptive strategies to drought and flooding in four West African countries	Côte d'Ivoire, Togo, MauritanieSénégal	Centre Suisse de Recherches Scientifiques en Côte d'Ivoire (CSRS), **Abidjan, Cote d'Ivoire**			Mr. Guéladio CISSE
	Adaptation to climate change and strategies to reduce the risk of water-borne illnesses in Guinea's forested zones	Guinea	Centre d'Études et de Recherche en Environnement, Université de Conakry, **Conakry, Guinea**			Dan Lansana KOUROUMA, Ph.D
	Analysis of the health impacts of climate change adaptation strategies: The case of transmission of zoonotic cutaneous leishmaniasis from Leishmania major in Tunisia	Tunisia	Administered by the Agence Tunisienne de Coopération Technique and implemented by l'Observatoire des Maladies Emergentes, **Tunis, Tunisia**			Mohamed Chahed
	Eco-Health Approach to the Control of Onchocerciasis in the Volta Basin of Ghana	Ghana	Noguchi Memorial Institute for Medical Research, University of Ghana, **Legon, Ghana**			Michael David WILSON

Project Number	Full Project Title	Geographic Area	Lead institution	Collaborating Institutions	Participating Institutions	Project Leader
104329	Enabling Stakeholders in Moroccan Coastal Management to Develop Sustainable Climate Change Adaptation Policies and Plans	Morocco	École Nationale Forestière d'Ingénieurs **Sale, Morocco**	EUCC - The Coastal Union, **The Netherlands** Faculty of Science - University of **Moncton, Canada**	Potsdam Institute for Climate Impact Research (PIK), **Germany** Institute Scientifique, University Mohamed V Rabat Agdal (UM5) Interdepartmental Center of Research in Environmental Science (CIRSA), (University of Bolongna) **Italy** National Meteorological Directorate (DMN), **Morocco** Faculté des Sciences Ain Chok, **Casablanca**	Dr. Abdelatif Khattabi
104682	Adapting Fishing Policy to Climate Change with the Aid of Scientific and Endogenous Knowledge	Cap Verde, Gambia, Guinea, Guinea Bissau, Mauritania and Sénégal	Environment and Development in the Third World (ENDA-TM), **Dakar, Senegal**	Réseau sur les politique de Pêche en Afrique de l'Ouest. (REPAO) - ENDA	Le Bureau WAMER (Western Africa Marine Eco-Region) du WWF, **Dakar, Sénégal** Enda Energie, Envrionnement et Développement La Faculté des Sciences de l'Université Cheikh Anta DIOP de **DAKAR** La Commission sous-régionale des pêches Le Centre de Recherche Océanographique de Dakar Thiaroye (CRODT), **Senegal** L'Institut National des Sciences Halieutiques de Boussoura de la Guinée (CNSHB) Les ministères chargés de la pêche et de l'environnement du Cap Vert, de la Gambie, de la Guinée, de la Guinée Bissau, de la Mauritanie et du Sénégal	Cheikh Gueye
104683	Rural-Urban Cooperation on Water Management in the Context of Climate Change in Burkina Faso	Burkina Faso	Institut de l'Environnement et de Recherches Agricoles (INERA), **Ouagadougou, Burkina Faso**		Direction Régionale des Ressources en Eau (DGRE), **Burkina Faso** Institut International de l'Eau et Environnement, **Burkina Faso** l'Office National de l'eau et de l'assainissement (ONEA) Directions Régionales de l'Agriculture, de l'Hydraulique et des Ressources Halieutiques Direction de la Météorologie Université de Ouagadougou, **Burkina Faso** Association des Maires du **Burkina Faso** IFDC Burkina Faso	Joachim Bonkoungou
104695	Advancing Capacities to Support Climate Change Adaptation through Five Pilot Projects (ACCCA) – UNITAR (Sub-Saharan Africa) Components:		United Nations Institute for Training and Research (UNITAR), **Geneva, Switzerland** Environnement Développement du Tiers Monde (ENDA), **Dakar Senegal**			Mamadou Moussa Diakhité
	Adapting to soil salinization induced by climate change in Senegal	Burkina Faso	Institut d'applications et de Vulgarisation en Sciences, **Ouagadougou, Burkina Faso**	Institut d'applications et de Vulgarisation en Sciences: Departments - Environnement, dynamiques sociales et développement communautaire; Communication et Vulgarisation en Science, **Burkina Faso** Centre Régional AGRHYMET, Département information et Recherche, **Niamey, Niger** Institute des Sciences de l'environnement; Université du Québec à Montréal		Mamadou Moussa Diakhité
	Pilot Project 2: Examining the Risks and Adaptive Strategies of Agrarian Households in Cameroon	Cameroon	University of Buea, **Buea, Cameroon**	University of Buea: Economics Department, Department of Geography; P.O Box 63, Buea, South West Province, **Cameroon** University of Nottingham, Department of Agriculture and Environmental Science Division, School of Bioscience,**UK**		Mamadou Moussa Diakhité
	Pilot Project 3: Improving Decision-Making Capacity of Small Holding Farmers in Response to Climate Risk in Three Drought Prone Districts of Tigray, Northern Ethiopia	Ethiopia	Mekelle University, **Addis Ababa, Ethiopia**	Mekelle University - Department of Land Resources Management and Environmental Protection (LaRMEP), **Mekelle, Ethiopia** Bureau of Agriculture and Rural Development (BoARD)		Mamadou Moussa Diakhité
	Pilot Project 4: Improving Decision-Making Processes to address Food Security and Water Management through Climate Change Scenario Generation in the Kano Plains of Eastern Africa	Kenya	Institute for Sustainable Commodities Kenya (ISCOM Kenya), **Nairobi, Kenya**	Institute for Sustainable Commodities, **Kenya** Jomo Kenyatta University of Agriculture and Technology - Department of Biomechanical and Environmental Engineering		Mamadou Moussa Diakhité
	Pilot Project 5: Adaptation Options for the Impoverished Mshayazafe Settlement through improved Water Supply, Drainage and Sanitation	South Africa	City of Durban, CSIR, **Durban, South Africa**	Council for Scientific and Industrial Research (CSIR) - Pollution and Waste Department eThekwini Municipality - Environmental Management Department, **Durban, South Africa**		Mamadou Moussa Diakhité
104707	Transferring the Malaria Epidemic Prediction Model to End Users in East Africa	Kenya, Tanzania, Uganda	Kenyan Medical research Institute (KEMRI), **Nairobi, Kenya**		National Institute for Medical Research (NIMR), **Tanga Centre, Tanzania** Ministry of Health, **Uganda** IGAD Climate Prediction and Application Centre (ICPAC), **Nairobi, Kenya** Walter Reed Army Institute for Research, Walter Reed Project (WRAIR), **Kenya** Internationa Centre for Insect Physiology and Ecology (ICIPE) Community Health Support (COHESU), **Kenya**	Dr. Andrew K. Githeko
					Kenyatta University, **Nairobi, Kenya**	

Project Number	Full Project Title	Geographic Area	Lead institution	Collaborating Institutions	Participating Institutions	Project Leader
104752	Pastoralist Livelihood Security: Developing Adaptive Capacity with a Focus on Nomadic Livestock Production under Climate Change	Kenya	Intermediate Technology Development Group Ltd (known as Practical Action), **Nairobi, Kenya**		Center for Research and Technology Development Institute, Maseno University, **Kenya (near lake Victoria)** National Environmental Management Authority (NEMA) - part of the Ministry of Environment and Natural Resources, **Kenya** Food Link Resources Institute, **Nairobi**	Dr. Willie Tuimising' Rono and Dr. Ayub Ndaruga Macharia
104795	InfoClim : Platform for Helping Vulnerable Communities Adapt to Climate Change	Sénégal	Centre de Suivi Écologique (CSE), **Dakar, Senegal**		Green Sénégal FONGs CERAAS / ISRA	Amadou Moctar Dieye and Assize Touré
104835	Altering the Climate of Poverty under Climate Change in Sub-Saharan Africa: Setting Priorities and Strategies for Adaptation with the Forests to Climate Change	Democratic Republic of Congo, Central African Republic, Cameroon	Center for International Forestry Research (CIFOR), **Kinshasa, DRC**		Commission des Forêts d'Afrique Centrale (COMIFAC), Regional Université de Bangui, **République Centrafricaine** Institut de Recherche Agricole pour le Développement (IRAD), **Yaoundé, Cameroon** Université de Kisangani, Democratic Republic of Congo	Denis Sonwa
104898	Community Based Adaptation to Climate Change in Africa	Kenya, Malawi, Sudan, South Africa, Tanzania, Uganda, Zambia and Zimbabwe	African Centre for Technology Studies (ACTS), **Nairobi, Kenya**		University of khartoum, **Sudan** EPMS, **Tanzania** DENIVA, **Uganda** CURE, **Malawi** EECZ, **Zambia** ZERO, **Zimbabwe** South-South-North Africa (SSN-Africa), **Cape Town, South Africa** IIED, UK SEI, Oxford and Stockholm BCAS, Bangladesh	Prof Judi W. Wakhungu
104903	Integrating Indigenous Knowledge in Climate Risk Management to Support Community Based Adaptation	Kenya	IGAD Climate Prediction and Application Centre (ICPAC), **Nairobi, Kenya**			Dr. Achola Pala and Prof. Laban Ogallo
105439	Using Demand Side Management to Adapt to Water Scarcity and Climate Change in the Saiss Basin	Morocco	Al Akhawayn University, **Ifrane, Morocco**			Ahmed Legrouri
105515	Adaptation to the Impacts of Sea Level Rise in the Nile Delta Coastal Zone	Egypt	National Water Research Center; Alexandria University; Centre for Development Services **Alexandria, Egypt** Alexandria University, **Egypt** Centre for Development Studies			Mohamed Abdrabo, Ahmed Farouk and Ibrahim Abdelmagid WIshinawy
105518	CCAA Challenge Fund: Support Fund for Local Adaptation Strategies	Burkina Faso, Mali, Senegal	Innovations, Environnement et Développement en Afrique (IED), **Dakar, Senegal**			Bara Gueye
105678	Adapting to soil salinization induced by climate change in Senegal	Senegal	Institut Sénégalais de recherches agricoles (ISRA), **Saint-Louis, Senegal**			Abdourahmane Tamba
105814	Climate Change and Human Health in Accra, Ghana	Ghana	Regional Institute for Population Studies, University of Ghana, **Accra, Ghana**	University of Ghana Medical School Ga Mashie Development Agency (GAMADA)		Samuel Nii Ardey Codjoe

Project Number	Full Project Title	Geographic Area	Lead institution	Collaborating Institutions	Participating Institutions	Project Leader
105815	Protecting Cotonou's Urban Community in the Face of Climate Change	Benin	le Centre de Recherche et d'Expertise pour le Développement Local, **Cotonou, Benin**	Municipalite de Cotonou Municipalite de Seme-Kpodji Municipalite d'Abomey-Calavi Laboratoire Pierre Pagney Climat, Eau, Ecosystemes et Developpement (Universite d'Abomey-Calavi) Laboratoire d'Etudes des Dynamiques Urbaines et Regionales (Universite d'Abomey-Calavi) Direction de la Prevention et de la Protection Civile due Ministere de l'Interieur Direction de la Protection Sanitaire du Ministere de la Sante ONG IRETI		Euloge Ogouwalé
105836	Exploring Urban-Rural Interdependence and the Impacts of Climate Change in Tanzania and Malawi	Malawi, Tanzania	Institute of Resource Assessment, University of Dar es Salaam, **Dar es Salaam, Tanzania**	Natural Resources & Environment Centre (NAREC) Natural Resource Institute	Intitut Africain pour le Developpment Economique et Social (INADES) Hombolo Local Government Training Institute Uyole Agricultural Research Institute (ARI) Department of Extension Office (DEO) Tanzania Traditional Energy Development and Environment Organization (TATEDO) Department of Environmental Affairs Mineral and Appropriate Technology Applicable to Malawi (MATAMA) Co-ordination Unit for Rehabilitation of the Environment (CURE) Department of Agricultural Extension and Technology Department of Crop Science	Dr Emma Liwenga
105838	CapaSIDS: Capacity Building and Knowledge on Sustainable responses to Climate Change in small Island States	Cape Verde, Sao Tome & Principe	Instituto de Engenharia Meccânica, com sede em Lisboa, **Lisbon, Portugal**		Sol & Vento, **Cape Verde** Instituto Nacional de Meterologia, Sao Tomé and Principe Centre for Environmental and Marine Studies (CESAM), Unversidade Aveiro, **Portugal** Mar Ambiente e Pesca Artesanal (MARAPA)	Ruis Maritins
105839	Implications of Climate Change on Rural-Urban Interactions: the Case Study of Aba and its Region, Southeastern Nigeria	Nigeria	Nigeria Environmental Study Action Team, **Ibadan, Nigeria**	IMO State University Owerri Nigerian Environmental Study/Action Team (NEST) Nichael Okpara University of Agriculture Umudike Abia State, **Nigeria** Women and Children Development Initiative (WACDI) Department of Agricultural Economics University of Ibadan		Enoch Okpara
105868	Sub-Saharan African Cities: A Five-City Network to Pioneer Climate Adaptation through Participatory Research and Local Action [Cape Town, Dar es Salaam, Maputo, Windhoek, Port St. Louis]	Mauritius, Mozambique, Namibia, Tanzania, South Africa	the International Council for Local Environment Initiatives, **Cape Town, South Africa**	Stockholm Environment Institute (SEI) UCT Department of Oceanography UCT Climate Systems Analysis Group (CSAG)	UCLG-Africa City of Cape Town City of Durban	Ms Lucinda Fairhurst
105869	Managing Water in the Rural-urban Interface in Ghana and Ethiopia: the Key to Climate Change Resilient Cities	Ethiopia, Ghana	International Water Management Institute, **Accra, Ghana**	Water Research Institute (WRI) University of Ghana Addis Ababa University		Liqa Rashid-Sally
106002	Strengthening the Role of Civil Society in Water Sector Governance Towards Climate Change Adaptation in Africa Cities – Durban, Maputo, Nairobi	Kenya, Mozambique, South Africa	York University, **London, Canada**		Centre for Civil Society (CCS), University of KwaZulu-Natal**, South Africa** Jubilee South Africa (JSA), **South Africa** Department of Urban and Regional Planning, University of Nairobi, **Kenya** School of Environmental Studies, Kenyatta University, **Kenya** Cruzeira do Sol, **Mozambique** Eduardo Mondlane university (UEM), **Mozambique** Livaningo, **Mozambique** International Uniopn for Conservation Nature (IUCN), **Mozambique**	Prof. Patricia E. Perkins

Project Number	Full Project Title	Geographic Area	Lead institution	Collaborating Institutions	Participating Institutions	Project Leader
			Capacity Building and Knowledge Sharing Projects			
104391	African Climate Change Fellowship Program	Multiregional	The global change SysTem for Analysis, Research and Training (START), **Washington, DC**	Institute for Resource Assessment (IRA) at the University of Dar es Salaam African Academy of Sciences		Dr Neil Leary
106391	Phase 2: African Climate Change Fellowship Program	Multiregional	Institute of Resource Assessment (IRA), **Dar es Salaam, Tanzania**			Prof Pius Z. Yanda
104779	An experimental approach to capacity and toolkit development for monitoring and evaluation within climate change adaptation initiatives	Multi-regional	United Nations Economic Commission for Africa (UNECA), **Addis Ababa, Ethiopia** Observatoire du Sahara et du Sahel, **Tunisia** Centre Régional AGRHYMET, **Nimey, Niger**			Urbain Zadi, Nabil Ben Khatra and Hubert N'Djafa Ouaga
104955	Knowledge Sharing and Research	Multiregional	Institute of Development Studies (IDS), **East Sussex, UK**	Environnement et dévelopment du tiers monde (ENDA-TM) Forum for Agricultural Research in Africa (FARA), **Accra, Ghana** IGAD Climate Prediction and Application Center (ICPAC), **Nairobi, Kenya**		Blane Harvey
106243	Phase II: Knowledge Sharing for Climate Change Adapatation in Africa 2010-12 and beyond	Multiregional	ENDA, **Dakar, Senegal**			Nicolas Drunet
105099	Promoting Participatory Action Research through Structured Learning on Climate Change Adaptation in Africa	Multiregional	Center for International Forestry Research (CIFOR), **Jakarta, Indonesia**			Ms Laura German
105602	Linking African Researchers with Adaptation Policy Spaces	Kenya, Malawi, Uganda	Institute of Development Studies (IDS), University of Sussex, **Sussex, UK**			Thomas Tanner

Eleven of these projects are grouped under two "umbrella" funding allocations made by the program in 2007–08: Advancing Capacity to Support Climate Change Adaptation: Five Pilot Projects, and Water, Health and Climate Change Adaptation in Africa, through which CCAA supports six projects.

The themes reflect those identified in CCAA's 2007 program strategy. A number of CCAA-supported projects have relevance to other important adaptation-related themes such as disaster preparedness, and climate information and forecasting methods. Forestry and pastoralism are captured under Agriculture and rural livelihoods; Health refers to those with a focus on vector or water-borne disease; Coastal includes fisheries, sea level rise, and broader coastal vulnerabilities to climate change.

Annex 2-3: Capacity building workshops supported by Climate Change Adaptation in Africa (CCAA)

CCAA supported 14 capacity building workshops on crosscutting topics relevant to research teams. These workshops were in addition to workshops organized within individual projects.

	Workshop	Date / Location	Lead Institution	Attended
1	**Integrated Climate Risk Assessment**	27-31 August 2007 Nairobi, Kenya	Universite Cheikh Anta Diop; IGAD Climate Prediction and Applications Centre; and AGRHYMET	47
2	**Proposal Development Workshop**	24-28 September 2007 Addis Ababa, Ethiopia	Organization for Social Science Research in Eastern and Southern Africa; West Africa Rural Foundation; and University of Dar es Salaam	37
3	**Project Management & Evaluation**	10-14 September 2007 Cairo, Egypt	West African Rural Foundation	41
4	**Research to Policy Linkages**	15-19 October 2007 Pretoria and Johannesburg, South Africa	Centre for Policy Studies; Kenya Institute for Public Policy Research and Analysis; and l'Université d'Abomey-Calavi (UAC)	37
5	**Gender Analysis**	17-23 February 2008 Dakar, Senegal	Makerere University and University of Cheikh Anta Diop	34
6	**Participatory Action Research**	16-20 September 2008 Adama/ Nazareth, Ethiopia (ENG) 6-10 October 2008 Cotonou, Benin (FR)	Centre for International Forestry Research (CIFOR) and l'Institut National Agronomique (Algeria)	20 Ethiopia 16 Benin
7	**Integrated Climate Risk Assessment**	24-28 Novemebr 2008 Nairobi, Kenya July 2008 Tunis, Tunisia (for African Dev. Bank)	Universite Cheikh Anta Diop; IGAD Climate Prediction and Application Centre (ICPAC)	62
8	**Proposal Development Workshop**	1 Aug 2008 Maputo, Mozambique	Organisation for Social Science Research in Eastern and Southern Africa (OSSREA)	30
9	**Gender Mainstreaming**	26-30 January 2009 Kampala, Uganda	Department of Women and Gender Studies, Makerere University	45

10	**Monitoring and Evaluation/Communications**	4-8 May 2009 Mombasa, Kenya	Measure Africa; West Africa Rural Foundation	46
11	**Integrated Climate Risk Assessment**	1-6 November 2009 Nairobi , Kenya	ICPAC, University of Nairobi; and University of Dakar	18
12	**Monitoring and Evaluation**	7-11 December 2009	FRAO, AFREA	8
13	**Gender Analysis**	24-29 January 2010 Naivasha, Kenya	Makere University	26
14	**Participatory Action Research**	20-25 September 2010	Centre for International Forestry Research (CIFOR)	9 project teams*
			Total attendees	469*

**Total number of attendees does not include PAR workshop count*

Annex 2-4: Recipients of conference support from Climate Change Adaptation in Africa (CCAA)

Through CCAA's Conference Support Fund, the program awarded grants to individuals to attend conferences in 2007-2008, and provided grants to institutions to organize conferences in 2008-2010.

CCAA supported a total of **44** individuals to attend conferences in 2007-2008, and the organization of **28** conferences by partner institutions from 2008-2010.

Conference Participants Supported in 2007-2008

	Name	Institution	Conference theme & location
1	Aristide Komze	Magazine Planète Jeunes	Leadership and Climate Change, Lead International Training Session for Cohort Twelve/Jakarta
2	Fama Sow	Agence Nationale de Conseil Agricole et Rural	Leadership and Climate Change, Lead International Training Session for Cohort Twelve/Jakarta
3	Cyrille Turatzinze	LEAD Rwanda	Session International LEAD sur le Leadership et les Changements Climatiques/Jakarta
4	Rosa Blauw	SouthSouthNorth (SSN)	COP 13 (Bali)
5	Abdoulaye Sarr	Direction de la Météorologie Nationale DMN	Interpreting Climate Change: Capacity Building for Developing Nations/Italy
6	Salome Alweny	Journalist - PANOS	COP13 Bali
7	Yolandi Groenewald	Journalist - PANOS	COP13 Bali
8	Wambi Micheal	Journalist - PANOS	COP13 Bali
	22 CCAA Researchers	Association de Recherche sur le Climat et l'Environnement	Role of spatial technologies in climate change adaptation in Africa
	5 CCAA Researchers	CCAA	COP13, Local adaptation to global climate change: Experiences from rural Africa (French)
	9 CCAA Researchers: Ba Awa Fally Bassiaka Dao Diop Mamadou Sall Ndiaga Ndao Babacar Seck Warégana Seck Coumba Diouf Sissokho Salif Foulani Thiao Ibrahima Paul	CCAA	Meeting of representatives of organizations of at-risk groups

Conferences Supported in 2008-2009

No.	Recipient institution	Event title	Date & Location
1	Observatoire du Sahara et du Sahel (OSS)	Outreach Workshop on the Findings of the IPCC Fourth Assessment Report (AR4).	Morocco (April 29-30, 2008)
2	Global Environment Facility (GEF)	International Conference on Evaluating Climate Change and Development	Alexandria, Egypt (May 10-13, 2008)
3	New Partnership for African Development – Environment Secretariat (SiNEPAD)	Regional Workshop on Adaptation in West and Central Africa : Identifying Capacity Building Needs for Integrating Adaptation into Policies	Dakar, Senegal (June 19-20, 2008)
4	Benin Ministry of Environment	Promoting Dialogue on Climate Change within the Economic Community of West African States (ECOWAS): First Meeting	Cotonou, Benin (June 23-27, 2008)
5	IGAD Climate Predictions and Applications Center-Kenya	Climate Outlook Forum for the Greater Horn of Africa Theme: Downscaling of Climate Forecast Products for Improved Agricultural Production and Food Security in the Greater Horn of Africa (GHA).	Nairobi, Kenya (Aug. 21-Sept. 1, 2008)
6	African Centre for Meterological Application for Development (ACMAD)	Forum on Seasonal Forecasting in Central Africa : Applications in Water, Resource Management, Agriculture and Health	Brazaville, Congo (September 2008)
7	Overseas Development Group, University of East Anglia	Short Courses in Climate Change and Development	University of East Anglia, Norwich, UK (September 1-12, 2008)
8	Africa Economic Research Consortium (AERC)	International Conference on Natural Resource Management and Climate Change in Africa	Nairobi, Kenya (September 15-17, 2008)
9	Centre Technique de Coopération Agricole et Rurale- Accord de Cotonou	Implications of Global Climate Change on Sustainable Agricultural Production Systems in ACP Countries (African Carribean and Pacific)	Ouagadougou, Burkina Faso (October 26-31, 2008)
10	UCAM Department of Environmental Sciences & Centre de Développement de la Région de Tensift (CDRT)/Morroco	Climate Change in Maghreb: Thresholds and Limits to Adaptation	UCAM Marrakech, Morocco (November 2008)
11	LEAD International	Megacities and Climate Change: Sustainable Cities in a Changing World	Xochitla, Mexico (November 16 – 22, 2008)
12	AGRHYMET/ Comité Inter États de Lutte contre la Sécheresse au Sahel (CILSS)/Centre Régional	Regional Capacity Building Workshop on Climate Change	Ouagadougou, Burkina Faso (November 18-21, 2008)
13	Uganda Science Journalists Association	Uganda Conference for Science Communication: Talking the Science We All Live	Kampala, Uganda (November 23-25, 2008)
14	Centre International de Recherche-Développement sur l'Elevage en zone Subhumide (CIRDES)/Burkina Faso	Demographic Evolution and Climate Change : Impacts on Vector Disease Transmission in West Africa	Cotonou, Benin (November 24-27, 2008)
15	Secrétariat international francophone pour l'évaluation environnementale (SIFÉE)	International Colloquium on "Climate Change and Environmental Evaluation : Issues and Tools for Evaluating Impacts and Implementation of Adaptation Plans"	Niamey, Niger (May 20-24, 2009)
16	World Bank	Cities and Climate Change: Responding to an Urgent Agenda	Marseille, France (June 28-30, 2009)

Conferences Supported in 2009-2010

No.	Recipient Institution	Event Title	Date and location
1	International Institute for Environment and Development (IIED)	Fourth International Conference on Community-Based Adaptation to Climate Change	Dar es Salaam, Tanzania (February 21-27, 2009)
2	The WorldFish Center	Envisioning 2050 : Climate Change, Aquaculture and Fisheries in West Africa	Dakar, Senegal (March 2010)
3	Makerere University	African Initiative Congress on Climate Change	Kampala, Uganda (November 1-4, 2009)
4	Eastern and Southern Africa Small Scale Farmers' Forum (ESAFF Uganda)	Sharing Experiences in Climate Change Adaptation in Eastern and Southern Africa	Kampala, Uganda (February15-19, 2009)
5	Ethiopian Environment Journalists Association(EEJA)	United Nations Climate Change Conference Copenhagen 2009	Copenhagen, Denmark (December 7-18, 2009)
6	Africa Water Association	Water and Sanitation: What Perspectives Facing the Energy Challenges and Climate Change	Kampala,Uganda (March 15-18, 2010)
7	Egerton University	Pastoralism & Climate Change Adaptation - Exploring All Options & Strategies	Mombasa, Kenya (May 23-27, 2010)
8	Cameroon Mangrove Network	Symposium on mangrove ecosystems vulnerability assessments and adaptation planning in Cameroon with perspectives for Africa	Douala, Cameroon (April 13-14 , 2010)
9	Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA)	Unlocking the potential of water productivity: Responding to climate variability and change challenges in Eastern and Central Africa	Monyonyo Commonwealth Resort, Uganda (March 2010)
10	International union for conservation of nature (IUCN), Central and West Africa Progamme	Climate change, biological diversity and poverty reduction policy in central and west Africa: regional issues and perspectives	Dakar, Senegal (March 22- 25, 2010)
11	l'Institut de Science Agronomique du Rwanda	Biodiversity and Adaptation to climate change in the Albertine Rift Region of Africa	Kigali, Rwanda
12	Comité National IGBP / l'Université Hassan 2	Rencontre Régionale: Adaptation aux changements climatiques au Maghreb: Bilan et Perspectives	Casablanca, Morroco (December 1-2, 2009)

Annex 2-5: African Climate Change Fellowship Program (ACCFP) Fellows

Below are profiles of alumni and current Fellows of the ACCFP:

45 alumni from phase one of the ACCFP

16 Policy Alumni

3 Teaching Alumni

13 Doctoral Research Alumni

13 Post-Doctoral Research Alumni

23 Fellows in a first round of fellowships in phase two of the ACCFP

9 Policy Fellows

14 Science Fellows

45 alumni from phase one of the ACCFP

16 Policy Alumni

Peter KALOKI
Home: International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Nairobi
Host: Egerton University - Crop Management, Research and Training (CMRT)
Project Title: "Identification of sources of heat tolerance in chickpea genotypes and its suitability as an adaptation option in agriculture"

Caroline Agosa KIRUNGU
Home: Kenya Sugar Research Foundation
Host: University of Orange Free State, Department of Agrometeorology and the South African Sugar Research Institute
Project Title: "Communicating climate change Coursework and comparative practical experience in South Africa"

Yamingue BETINBAYE
Home: LEAD Tchad
Host: Centre for International Forestry Research (CIFOR), Burkina Faso
Project Title: "Using local knowhow for climate change adaptation: The case study of Malo Gaga"

David Kimani KURIA
Home: Kijabe Environment Volunteers
Host: BirdLife International, Climate Change Programme, Kasarani Campus
Project Title: "Project Kereita 2009: Understanding local communities' knowledge and their adaptation mechanisms to climate change"

JeanBerchmans MBAZUMUTIMA
Home: Institut Geographique du Burundi (IGEBU)
Host: Institute of Resource Assessment, University of Dar es Salaam (IRA-UDSM)
Project Title: "Increasing awareness of climate change and the need for national policies for climate change adaptation in Burundi"

Joelle MUKUNGU NKOMBELA
Home: Organisation Concertée des Ecologistes et Amis de la Nature (OCEAN)
Host: Centre for International Forestry Research (CIFOR), Burkina Faso
Project Title: "Adaptation to climate change in Africa: Case study of the agriculture sector in Burkina Faso"

Gerald Maina MURIUKI
Home: Practical Action – Kenya
Host: Kenyatta University, Department of Environmental Planning and Management
Project Title: "Strengthening Adaptive Capacity to Climate Change: Participatory Infrastructure Planning in KiberaSilanga"

Felix OLORUNFEMI
Home: Nigeria Institute for Social and Economic Research
Host: University of Cape Town (UCT)
Project Title: "Climate change impacts in the informal settlements of the Western Cape – Understanding preparedness, vulnerability, and adaptation options"

Nancy Akinyi OMOLO
Home: Foodlink Resources
Host: University of KwaZulu-Natal (UKZN)
Project Title: "Gender, pastoralism and climate change: Vulnerability and adaptation in Turkana in Northern Kenya

Naima OUMOUSSA
Home: Peace Corps Morocco
Host: UNCCD Secretariat, Regional Coordination Unit for Africa
Project Title: "Examining and facilitating complementarities between forestry projects included in UNCCD National Action Programs and UNFCCC National Adaptation Programs of Action – Case studies from Least Developed Countries in the Sahel"

Monica Kansiime OWUOR
Home: Heifer International Uganda
Host: Egerton University
Project Title: "Enhancing livelihoods and resilience through community land use planning and mapping"

Linda PHALATSE
Home: City of Johannesburg
Host: University of Witswatersrand
Project Title: "Communicating with stakeholders to inform and promote climate change adaptation for the City of Johannesburg"

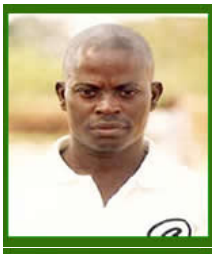
Christian RIZIKI KABWE RIZE
Home: Tayna Center for Conservation Biology – Kasugho Université for Nature Conservation and Développement (TCCB-KUNCD)
Host: University of Cadi Ayyad
Project Title: "Raising awareness of climate change risks and adaptation options in DR Congo"

SALE ABOU
Home: Institute for Agricultural Research for Development (IARD)
Host: Egerton University
Project Title: "Identification and evaluation of the efficiency of peasants' agricultural strategies for climate change adaptation in order to improve natural resources management policies in arid and semiarid regions of Africa"

Arame TALL
Home: Red Cross / Red Crescent Climate Center
Host: Université Cheikh Anta Diop de Dakar (UCAD)
Project Title: "Training Red Cross National Societies for climate change adaptation, early warning and early action"

Maximilien TIOGANG DJOMO
Home: Ministry of Environment and Protection of Nature, Western Provincial Delegation, National Action Plan for the Fight against Desertification, Cameroon
Host: Centre for International Forestry Research (CIFOR), Cameroon
Project Title: "Multiactor approaches and local development strategies in the management of water and forest resources for climate change adaptation"

3 Teaching Alumni



Moses Adeyeye Adeyemi AWODUN
Home: Federal University of Technology, Akure
Host: N/A
Project Title: "Empowering rural farmers to trade out poverty through Jatropha farming in Nigeria – Demonstration plots and participatory training at the Federal University of Technology, Akure, Nigeria"

Andre LENOUO
Home: University of Douala
Host: Université Cheikh Anta Diop de Dakar (UCAD)
Project Title: "Enhancing capacity for climate data processing, climate variability scenario development, and application to agricultural yield sensitivity in the Master's program of the Department of Physics, University of Douala

Nicholas OZOR
Home: University of Nigeria, Nsukka
Host: N/A
Project Title: "Influencing curriculum development and knowledge of climate change issues at the University of Nigeria, Nsukka and environs"

13 Doctoral Research Alumni

Grace Adeniji
Project Title: Assessing women's coping strategies with respect to water variability and vulnerability in the Oyo North Region, Nigeria

Paul AHIDJO
Home: University of Ngaoundere, Cameroon
Project Title: "Ecology and history of settlements on the outskirts south of lake Chad : links between climate insecurity, human movement, adaptation strategies and environmental restoration of the XVIe XXe century"

Vincent Olanrewaju AJAYI
Home: Federal University of Technology – Akure
Host: University of Cape Town - Climatic Systems Analysis Group (UCT-CSAG)
Project Title: "The impact of landuse changes on the Rainfall efficiency of the West African Mesoscale convective system (MCS)"

Warvar P. Isabelle DABIRE
Home: Institute for Environmental and Agricultural Research (INERA)
Host: University of Ghana, Department of Geography
Project Title: "Economic interest of seasonal forecasting in Burkina Faso: Bioeconomic modeling for agricultural farmers"

Temesgen DERESSA
Home: University of Pretoria
Host: International Food Policy Research Institute (IFPRI)
Project Title: "An analysis of the determinants of Ethiopian farmers' choices with respect to coping mechanisms for climate extremes"

Augustin KABORE
Home: University of Abomey-Calavi, Benin
Host: Centre for International Forestry Research (CIFOR), Burkina Faso
Project Title: "Community strategies for adaptation to climate change: Case study of sacred forests in the sociocultural context of Moaaga of Burkina Faso"

Amidou Njiloh KPOUMIE
Home: University of Yaounde
Host: University of Cadi Ayyad
Project Title: "Impacts of and adaptations to climate and anthropological changes on water resources: Agropastoral activities and energy production in the Sanaga catchment area, Cameroon"

Tiganadaba LODOUN
Home: Institute of Environment and Agricultural Research (IEAR)
Host: International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Mali
Project Title: "Impact of climatic variability and change on food security in Burkina Faso"

Chipo Plaxedes MUBAYA
Home: Midlands State University
Host: Institute of Resource Assessment, University of Dar es Salaam (IRA-UDSM)
Project Title: "Farmers' coping and adaptive strategies to climate variability and change: experiences from Zambia and Zimbabwe"

Mzime Regina NDEBELEMURISA
Home: University of Zimbabwe
Host: University of KwaZulu-Natal (UKZN)
Project Title: "Modeling primary production in Lake Kariba as a means of mitigating against climate change"

S.W. Charles RECHA
Home: Kenyatta University
Host: International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Mali
Project Title: "Potential Climate Impacts And Associated Vulnerabilities on Water Resources and Livelihoods at the Household Level: Tharaka District, Kenya"

Emmanuel TACHIEOBENG
Home: University of Ghana
Host: University of Cape Town - Climatic Systems Analysis Group UCT-CSAG)
Project Title: "Modeling adaptation responses to climate change scenarios for food security in Ghana"

Bernard TYUBEE
Home: Benue State University
Host: Makerere University
Project Title: "The Urban Heat Island in Makurdi, Benue State"

13 Post-Doctoral Research Alumni

Getachew Tesfaye ABEBE
Home: Institute of Biodiversity Conservation
Host: Makerere University
Project Title: "Predicting climate change effects on reproductive phenology and distribution of coffee 'Arabica l.' in the afromontane rainforests of Ethiopia"

Pierre AKPONIKPE
Home: Faculty of Agronomical Sciences, Laboratory of Hydraulics and Water Management (LHME)
Host: University of Cape Town - Climatic Systems Analysis Group (UCT-CSAG)
Project Title: "Use of numerical computer simulations to evaluate the effectiveness of farmers' agricultural management strategies for climate change adaptation in SubSaharan West Africa"

Ladislaus Benedict CHANG'A
Home: Tanzania Meteorological Agency
Host: Institute of Resource Assessment, University of Dar es Salaam (IRA-UDSM)
Project Title: "Improving drought early warning system in Tanzania: A case of Southwestern Tanzania"

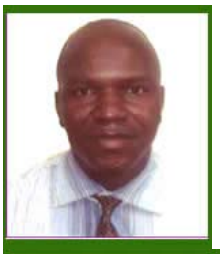
Aliou DIOUF
Home: N/A
Host: Université Cheikh Anta Diop de Dakar (UCAD)
Project Title: "Climate change and food security in West Africa: Climate change impacts and strategies for adapting in agriculture (rain) and in livestock breeding in two regions in Senegal: Sob (Fatick) and Tatki (Ferlo)"

Mayowa Johnson FASONA
Home: University of Lagos
Host: University of Cape Town - Climatic Systems Analysis Group (UCT-CSAG)
Project Title: "Patterns of terrestrial ecological imprints and feedbacks and their implications on climate change adaptation in the wooded savannah of Nigeria"

Sisthabiso GANDURE
Home: University of Zimbabwe, Center for Applied Social Science
Host: University of the Free State, Department of Soil, Crop, and Climate Science
Project Title: "The impact of agriculturebased climate change adaptation strategies on food security among smallholder farmers in southern Africa"

CyriaqueRufin NGUIMALET
Home: University of Bangui
Host: Egerton University
Project Title: "Surveying climate change perceptions and local coping strategies for water management: Cases of Sibut, KagaBandoro and Bouca (Central African Republic)"

Nhamo NHAMO
Home: N/A
Host: University of Ghana, Department of Crop Science
Project Title: "Indigenous knowledge and climate change adaptation: Assessing the effectiveness of smallholder farmers' adaptation options for water and nutrient productivity in agriculture"



Saidu OSENI
Home: Obafemi Awolowo University
Host: Egerton University
Project Title: "Climate change, genetics of adaptation and livestock production under low input systems"

Sean Henry O'DONOGHUE
Home: University of KwaZulu-Natal (UKZN)
Host: University of KwaZulu-Natal (UKZN)
Project Title: "Developing regionally specific algorithms for chorophylla satellite image data in the case 2 waters of the Natal Bight"

Fritz Oben TABI
Home: University of Dschang
Host: University of Ghana, Department of Crop Science
Project Title: "Soil fertility management options adapted to changing climatic conditions in lowland ricebased cropping systems"

Mamadou TRAORE
Home: University Polytechnic of Bobo Dioulasso, Institute of Rural Development
Host: International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Niger
Project Title: "The potential for agronomical enhancement via application of Jatropha curcas oilcake as a fertilizer on maize plots"

Edouard Henri TONNANG ZEFACK
Home: N/A
Host: Institute of Resource Assessment, University of Dar es Salaam (IRA-UDSM)
Project Title: "Predicting and mapping the potential redistribution of malaria vectors in Africa: Informing malaria control programmes"

23 Fellows in a first round of fellowships in phase two of the ACCFP

9 Policy Fellows

OUINAKONHAN Comlan Médard (BENIN)
Home: Direction Générale de l'Environnement du Ministère de l'Environnement et de la protection de la nature
Host: University of Parakou, Faculty of Agronomy
Project Title: Proposed policy framework for Water Resource Management focus on agriculture to adapt to climate change in Benin.

MUMBERE LANGO Luc (RDC)
Home: Tayna Center for Conservation Biology
Host: Institute of Resource Assessment – University of Dar Es Salaam (IRAUDSM)
Project Title: Assessment of adaptive management for ecosystems resilience to climate change: case study of protected area and wetland in Tanzania.

Charlote Fonocho (CAMEROON)
Home: Consultants and Intermediaries in Mining, Energy and Environment
Host: Cameroon Wildlife Conservation Society (CWCS)
Project Title: Impact of Climate Change on the Cameroon Coastal Environment: Vulnerability Assessments, Mitigation and Adaptation Measures and Policies with Applications to Environmental Impact Assessment.

Mahlalele Tlali Eunice (Lesotho)
Home: Department of Water Affairs
Host: WaterNET
Project Title: Mainstreaming Climate Change Adaptation into the Water Resources Management and Development of Lesotho

Oluka Godfrey (UGANDA)
Home: Kampala Capital City Authority
Host: Walker Institute for Climate System Research, University of Reading
Project Title: Enhancing Urban Adaptation to Climate Change through Effective **Ecosystem Governance:** A Case Study of Kampala City

Seth Kayombo (UGANDA)
Home: Biodiversity Conservation for Rural Development-Uganda (BCRD- Uganda)
Host: Egerton Univesity
Project Title: Climate Change Adaptation Strategies of the Indigenous Minorities in the Central Albertine Rift Region: A Case of Batwa (Pygmy) Communities of Echuya Forest Reserve, South-Western Uganda.

Bessie Madziwa (ZIMBABWE)
Home: Zvishavane Water Project
Host: African Technology Policy Studies Network (ATPS)
Project Title: Climate change adaptation for increased food security in Semi arid Zimbabwe

Happison Chikova (ZIMBABWE)
Home: Help Initiatives for People Organization
Host: Institute of Resource Assessment – University of Dar Es Salaam (IRAUDSM)
Project Title: An analysis of the current ecosystem management practices, policies, minstitutional, legal framework and approaches and the extent to which they address climate change in Masvingo province. A case of Zimbabwe's rural areas.

Rutendo Nhongonhema (ZIMBABWE)
Home: Ministry of Agriculture, Mechanization and Irrigation Development
Host: Walker Institute for Climate System Research, University of Reading
Project Title: An assessment of effects of climate change on crop production across agro-ecological zones in Zimbabwe

14 Science Fellows

Georges Djohy (BENIN)
Home: Faculty of Agronomy / University of Parakou
Host: Nigerian Institute of Social and Economic Research (NISER)
Project Title: Agent-Based Modeling Of Herders' Vulnerability And Adaptation Strategies Regarding Water Resources In Climate Change Context In Alibori (Benin)

Grace Mudombi (ZIMBABWE)
Home: University of Zimbabwe
Host: Institute of Resource Assessment – University of Dar Es Salaam (IRAUDSM)
Project Title: Factors affecting smallholder farmers' perceptions and responsiveness to climate variability induced hazards: A case of Seke and Murewa districts in Zimbabwe.

Gapia Martial (AFRIQUE CENTRALE)
Home: Université de Bangui/Département de Géographie/ Laboratoire de Climatologie, cartographie et d'Etudes Géographiques(LACCEG)
Host: Center for International Forestry Research (CIFOR) – Central Africa Regional Office (CARO)
Project Title: Title: Pluviometric hydro variability and country adaptations in the watershed of the Sangha in the forest of Central Africa

KOUAKOU Yao Etienne (COTE D'IVOIRE)
Home: Centre Suisse de Recherches Scientifiques en Côte d'Ivoire
Host: University Cadi Ayyad (UCAM) & Centre de Développement de la Région de Tensift (CDRT) Morocco
Project Title: Sustainable Management of Water Resources in Context of Climate Change

Mekonnen Adnew (ETHIOPIA)
Home: Addis Ababa University, Department of Geography & Environmental Studies
Host: International Water Management Institute (IWMI)
Project Title: The Impact of Climate Change on Extreme Hydroclimate Events (Drought and Flood) and Adaptation/Management Practices in the Omo-Ghibe basin, Southwest Ethiopia

Francis Opiyo (KENYA)
Home: University of Nairobi
Host: African Technology Policy Studies Network (ATPS)
Project Title: Assessing Impacts of Climate Variability on Vulnerability and Adaptation Strategies among Turkana Pastoralists of Northwestern Kenya

Fontodji Kokou Jeremie (TOGO)
Home: Université de Lomé, Faculté des Sciences
Host: Université de Parakou, Benin
Project Title: Study of vulnerability and adaptation of sub-sector of biomass energy to climate change in Sub-Saharan Africa: the case of Togo.

Pereki Hodabalo (TOGO)
Home: Université de Lomé
Host: Center for International Forestry Research (CIFOR) – West Africa Regional Office (WARO)
Project Title: Dry forests structure analysis, stand volume estimation and carbon storage potential of Abdoulaye protected area in Togo: Remote Sensing approach

Galiné YANON (TCHAD)
Home: Université Cheikh Anta Diop De Dakar
Host: AGRHYMET Regional Center
Project Title: Climate risks and socio-economic constraints in the Senegalese Groundnut Basin, analysis of the vulnerability and the strategies of the rural people adaptation in the department of Bambey

SAMBO Armel (CAMEROUN)
Home: Institut Supérieur Du Sahel (ISS) – Université de Maroua
Host: University Cadi Ayyad (UCAM) & Centre de Développement de la Région de Tensift (CDRT) Morocco
Project Title: Local Representations and Practices to the Adaptation of Climatic Changes in the Rational Management of Lake Chad Water Resources

Bernard Kibet Kirui (KENYA)
Home: Kenya Marine and Fisheries Research Institute
Host: Institute of Resource Assessment – University of Dar Es Salaam (IRAUDSM)
Project Title: Climate change effects on mangrove forest provisioning of goods and services and their adaptation; Case Study of Tana River Delta, Kenya

Dr Ayeni Owolabi Ayeni (NIGERIA)
Home: Water Resources, Climate Change and GIS, Department of Geography,University of Lagos
Host: Council for Scientific and Industrial Research (CSIR)
Project Title: Improving the resilience of rural communities to water stress around induced Derived Savanna region of Nigeria

Tolo Casim (UGANDA)
Home: Mbarara University of Science & Technology
Host: Institute of Resource Assessment – University of Dar Es Salaam (IRAUDSM)
Project Title: Investigation of local and Indigenous Knowledge Systems in Climate risk Management and Mitigation of Community Vulnerability against Impacts of Climate Change in Lake Victoria basin: Case study of Rakai and Isingiro Districts, Uganda

Bamutaze Yazidhi (UGANDA)
Home: Makerere University the Department of Geography, Geo-information and Climatic Sciences
Host: Makerere University Agricultural Research Institute Kabanyolo (MUARIK)
Project Title: Assessing Community Resilience to Climate Change and Disasters and Efficacy of Governance Mechanisms for Sustainable Adaptation in Uganda's cattle Corridor

Annex 3-1: Key knowledge sharing and communications statistics

Climate Change Adaptation in Africa Program Communications

By the time the program closed in March 2012, there were **195**[1] media articles and broadcasts about the CCAA program and projects.

CCAA program web pages on the IDRC website had drawn over **85,000** unique visitors.[2]

Web contents were also shared through an e-bulletin, *Adaptation Africa*, which had **2414** subscribers.

AfricaAdapt Knowledge Sharing Platform - Phase One

By the end of the first phase of funding for the AfricaAdapt knowledge sharing platform, the online community component of the platform had recorded:

- just over **1,000** registered members, **88%** of whom were from African countries
- **43,500** visits – visits in 2010-11 ranged from **2,000-4,000** per month
- nearly **22,000** unique visitors
- over **125** projects and initiatives from across Africa featured on the site
- over **400** followers via Twitter, including from the World Bank, DFID, IDRC, Wageningen University, the *Guardian*'s Katine Project, NEPAD, FAO, CTA, the UNDP's ALM and IFAD

AfricaAdapt also included offline knowledge sharing initiatives, including the Knowledge Sharing Innovation Fund, which funded **15** projects to engage hard-to-reach groups in phase one.

[1] See Annex 3-2 for a table of media coverage of Climate Change Adaptation in Africa.
[2] See Annex 3-4 for a list of links to CCAA content on the IDRC website.

Annex 3-2: Table of media coverage of Climate Change Adaptation in Africa (CCAA)

Type of Media	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Totals (by type)
Articles	14	17	38	57	33	13	172
TV/film	0	0	1	1	4	0	6
Radio	3	1	1	3	4	0	12
Blogs	0	0	0	2	3	0	5
Totals (by year)	17	18	40	63	44	13	195

2011-2012 Media Coverage

	Date	Outlet	Title	Content	Location	Media	Language
1	April 2011	JotoAfrika	Women as key players in climate change adaptation	ACCFP Fellow Grace Adeniji is the guest editor of the March 2011 issue of JotoAfrika	Africa	Web	English
2	April 2011	JotoAfrika	Including women in adaptation processes	A CCAA project on community based adaptation led by Indigo development& change is highlight in the March 2011 issue of JotoAfrika	Africa	Web	English

	Date	Outlet	Title	Content	Location	Media	Language
3	April 2011	JotoAfrika	Changing gender roles due to climate change in northern Kenya	Nancy Omolo, an ACCFP fellow and research of the CCAA pastoralist project wrote a profile on the project for the March 2011 issue of JotoAfrika	Africa	Web	English
4	28 April 2011	Journal de Bangui	Les médias centrafricains à l'école du changement climatique		France	Web	French
5	28 April 2011	Le Sud Quotidien	Un tiers des superficies cultivables affecte par la salinisation au Sénégal	CCAA-supported project led by l'Institut sénégalais de recherches agricoles (ISRA) hosts a workshop to convene researchers on soil salinisation.	Senegal	Web	French
6	2 May 2011	Le Sud Quotidien	Plaidoyer pour une capitalisation des expériences locales	This article highlights an event to share research findings from the CCAA project Challenge Fund for Local Adaptation Options.	Senegal	Web	French
7	24 May 2011	IRIN News	Global lessons from Durban's climate change challenges	Project leader Debra Roberts is interviewed in this article regarding the implementation of an adaptation plan in the City of Durban	Global	Web	English
8	6 June 2011	The Guardian Nigeria	NGOs coalition on Abia climate change adaptation underway		Nigeria	Web	English
9	6 June 2011	IFAD **Social Reporting Blog - International**	Capitalizing on IDRC's experiences in Climate Change Adaptation in Africa		Global	Web	English

	Date	Outlet	Title	Content	Location	Media	Language
10	11 August 2011	SciDev	How climate data is bringing benefits to Senegal's farmers	Write-up on the InfoClim project, featuring Innocent Butare	Senegal	Web	English
11	October 2011	New Agriculturalist (French Edition)	Egypte : Vulnérabilité des zones côtières	Guy Jobbins is interviewed in an article featuring our project on Sea Level Rise in the Nile Delta Coastal Zone	Global	Web	French
12	October 2011	JotoAfrica	JotoAfrika: Adapting to Climate Change in Africa (Issue 8)	CCAA Team Leader Fatima Denton was guest editor for this issue and wrote the editorial.	Africa	Web	English
13	October 2011	E + Z	Anpassung an den Klimawandel Den Drachen zähmen (English Translation also available here)	Article summarizes needs for local enhancing capacities to adapt to climate change, based on interviews including one with Fatima Denton.	Germany	Web	German (English translation available)

2010-2011 Media Coverage – 44 hits

	Date	Outlet	Title	Content	Location	Media	Language
1	April 2010	Atlantic Rising Blog	Life on the Edge : Women and climate change in Morocco	The research of Moroccan Coastal Management project is highlighted in this blog	UK	Blog	English

	Date	Outlet	Title	Content	Location	Media	Language
2	22 April 10	Le Matin	L'adaptation aux changements climatiques	Article features CCAA supported project on Moroccan Coastal Management	Morocco	Web	French
3	25 April 10	Ethiopian Report	Title Unknown	ACCFP Fellow Getachew Abebe was featured in article discussing Climate Change Adaptation for Coffee Arabica	Ethiopia	Web	English
4	29 April 10	IPS	Kenya: Successful Weather Prediction Uses Old And New	Article highlights work ICPAC-led project that integrates indigenous and scientific knowledge to help communities adapt to climate change	Global	Web	English
5	May 2010	Radio Show (SAFm)	Science Matters	ACCFP Fellow Mzime Ndebele-Murisa was interviewed on a nation radio program to discuss one of the Issues of the South African Journal of Science (SAJS)	South Africa	Radio	English
6	5 May 10	Reuters	Kenya develops tool to predict malaria	A tool to predict malaria outbreaks in East Africa is developed by the KEMRI project	Global	Web	English
7	24 May 10	The Guardian	The serial killer that has moved into Tanzania's idyllic highlands	A tool to predict malaria outbreaks in East Africa is developed by the KEMRI project	UK	Web	English
8	15 May 10	almasryalyoum	An expedition to Boudinar and Saidia	In Arabic	Egypt	Web	Arabic
9	25 May 10	ReliefWeb	Kenya: Climate change affects rainmakers' predictions	Article discusses research led by ICPAC on the challenges faced by the Nganyi traditional “rainmakers” of Western Kenya in light of changing weather patterns.	Global	Web	English

	Date	Outlet	Title	Content	Location	Media	Language
10	16 June 10	Walf Fadjri	Conservation de la nature : Les pays d'Afrique occidentale et centrale se concertent	Article covers the CCAA-supported knowledge exchange on conservation efforts in West and Central Africa, organized by the International Union for the Conservation of Nature (IUCN).	Senegal	Web	French
11	18 June 2010	Le Municipal	Inondations sévères au Bénin et dans la sous-région : Les populations face à la dure réalité des changements climatiques	Article on flooding in Benin sites CCAA supported research and establishment of rural early warning system led by IDID-ONG	International	Web	French
12	7 July 10	Le Soleil	Adaptations aux changments climatiques : Djibo Leïty Ka pour des actions concrètes	Article highlights knowledge sharing event organized by CSE, leaders of the InfoClim project	Senegal	Web	French
13	7 July 10	SudOnline	Les acteurs internationaux prônent le partage et la diffusion des informations	Article highlights knowledge sharing event organized by CSE, leaders of the InfoClim project	Senegal	Web	French
14	12 July 10	Middle East Online	Boudinar rural commune: Tremendous natural resources	Article on the vulnerability of fisheries in north east Morocco featuring Moroccan coastal project	Middle East	Web	English
15	13 July 10	Voices of Community	Adapting to Climate Change by Storing Rainwater, Developing resilient Crops	Project leader Khattabi is interviewed in this article concerning Moroccan water and coastal management	Global	Blog	English
16	14 July 10	Le Soleil	Climat et (in)sécurité alimentaire : communiquer pour mieux s'adapter	Article highlights knowledge sharing event organized by CSE, leaders of the InfoClim project	Senegal	Web	French

	Date	Outlet	Title	Content	Location	Media	Language
17	14 July 10	Walf Fadjri	Adaptation au changement climatique : Les spécialistes africains se concertent à Dakar	Article highlights knowledge sharing event organized by CSE, leaders of the InfoClim project	Senegal	Web	French
18	19 July 10	Middle East Online	Climate change affects north eastern Morocco fishermen	Article on the vulnerability of fisheries in north east Morocco featuring Moroccan coastal project	Middle East	Web	English
19	27 July 10	Tam-tam Canada Radio Canada International	Un Sénégalais à la conférence Zone côtière Canada 2010	Project leader Cheikh Gueye interviewed about APECCAO research on climate change impacts on West African fisheries	Canada and Internationla	Radio	French
20	17 Aug 2010	The Zimbabwean	Community-based adaptation to climate change in Africa project launched	The Zimbabwe component of the CBAA project is launched by African Centre for Technology Studies (ACTS)	Zimbabwe	Web	English
21	22 August 2010	Cameroon Radio Outlet	No title	Paul Ahidjo was interviewed by a regional radio program regarding the impacts of climate change on the Sahel	Cameroon	Radio	French

	Date	Outlet	Title	Content	Location	Media	Language
22	25 Aug 2010	Magreb Arabe Presse / Maroc Journal	Présentation à Rabat des résultats du projet "Adaptation aux changements climatiques au Maroc"	CCAA research partners from Morocco present research findings for agriculture, fisheries and tourism sectors at a meeting in Rabat, Morocco.	International	Web	French
23	29 Aug 2010	L'équipe "Documentaires" France 5	Sale Temps pour la planete : Maroc, en marche contre le desert	A video from a series on climate change featuring Moroccan coastal project	International	TV series	French
24	Sept 2010	AfricaAdapt, UNDP	Participatory Video from AfricaAdapt's Innovation Fund : Morocco	In conjunction with AfricaAdapt's Innovation Fund and the UNDP, Moroccans from the Iguiouaz oases share their stories about climate change and ways they are adapting to increasing desertification in the region.	International	Web Video	English subtitles
25	01 Sept 2010	The Standard	Kenya's to know malaria epidemic in advance	CCAA research partner Dr. Githeko is featured in this article which highlights the malaria prediction model developed by his team at KEMRI.	Kenya	Web	English
26	20 Sept 2010	The Independent	New tool predicts malaria 90 days before an outbreak	CCAA research partner Dr. Githeko is featured in this article which highlights the malaria prediction model developed by his team at KEMRI.	UK	Web	English
27	22 Sept 10	Ethiopian Report	Title Unknown	ACCFP Fellow Getachew Abebe was featured in an article discussing Crop Genetic Resources (Biodiversity) Research and Utilization New Policy for Ethiopia	Ethiopia	Web	English
28	October 2010	Fatick FM	Radio Interview	ACCFP Fellow Aliou Diouf was interviewed for a regional radio on climate change's general causes and consequences, and the results of his research	Senegal	Radio	English

	Date	Outlet	Title	Content	Location	Media	Language
29	12 Oct 2010	Ouest France	Le banlieue de Dakar sous les eaux	CCAA Program Management Officer Alioune Kaere is quoted in this *Ouest France* article	International	Web	French
30	9 Nov 2010	France 5	Sale temps pour la planete	Abdellatif Khattabi, leader of project 104329, was featured in a French TV production on climate change in Morocco	Morocco	TV	French
31	10 Nov 2010	IRIN News	Benin: Evaluer les couts d'inondation	Said Hounkponou from the CCAA-supported PARBCC project is quoted in this IRIN news article on the recent devastating floods in Benin.	International	Web	French
32	14 Nov 2010	Reuters	Sea level rise threatens Egypt's Nile Delta & Alexandria.	Members of CORI research team leading project on Nile Delta sea level rise quoted in this article	International	Web	English
33	24 Nov 2010	One World.net	West African Fisheries Adapt to Climate Change	West African Fisheries project is profiled on OneWold.net	International	Web	English
34	10 Dec 2010	Climate Change Media Partnership	Experts: African maize culture militates against climate adaptation	CCAA partner Blessings Chinsinga is interviewed during COP16 in Cancun	International	Web	English
35	6 Jan 2011	BirdLife International	For he's a jolly good (Africa Climate Change) Fellow!	ACCFP Fellow David Kuria completes his fellowship with BirdLife Africa Secretariat in Nairobi, Kenya	International	Web	English
36	January 2011	Terre Débrouillards	Télédétection: des images qui sauvent	The Nyganyi indigenous knowledge project linking was picked up in this children's magazine to highlight how climate information helps communities in agriculture	International	Print	French
37	January 2011	Résonances	Changements climatiques: Suivi-évaluation des capacités d'adaptation en Afrique	The Observatoire du Sahara et Sahel reported on the second CCAA learning forum on monitoring and evaluation	Africa	Print	French
38	January 2011	ScienceAfrica	Eastern Africa: Weather Experts and Institutions Finally at the Top	The work and research of project leader Laban Ogallo from ICPAC is discussed in this article	Africa	Web	English

	Date	Outlet	Title	Content	Location	Media	Language
39	13 January 2011	The Namibian	Elders can help in the fight against climate change	Article on indigenous climate knowledge cites the work done under CCAA project in western Kenya with Ngani traditional forecasters	International and Namibia	Web and print	English
40	25 January 2011	LPBV France 3	Interview for documentary	A journalist at the French press agency LPBV interviewed ACCFP Fellow Getachew T Abebe for a documentary on climate change in Ethiopia	Africa	Film	English
41	27 Jan 2011	The Daily Times	'Give farmers alternatives to tobacco'	IDRC's President visited a CCAA project helping farmers in Malawi adapt to climate change	Malawi	Print	English
42	8 Mar 2011	Network of Climate Journalists of the Greater Horn of Africa	Climate Change Symposium 2011-AfricaAdapt Addis Ababa, March 9-11	Article announces the AfricaAdapt Climate Change Symposium	Africa	Web	English
43	March 2011	IISD Blog for the UN Climate Change Policy & Practice	IPC-IG Discusses Climate-Compatible Development at AfricaAdapt Meeting	Article highlights the AfricaAdapt Climate Change Symposium	Global	Blog	English
44	17 March 2011	ResearchSEA - United Kingdom	IDRC President surveys climate research in East Africa	This article discusses David Malone's visit to a CCAA project in Malawi looking at crop diversification as an adaptation strategy	UK	Web	English

2009-2010 Media Coverage – 63 hits

	Date	Outlet	Title	Content	Location	Media	Language
1	April-May 2009	ScienceAfrica	IDRC Heliping Africa Cope with Climate Change	Article highlights President David Malone's visit to Kenya and IDRC's contribution to African research in climate change	Nairobi	Web / Print	English
2	April-May 2009	ScienceAfrica	Climate Change Linked to Lethal Infections, KEMRI Expert Says	Dr. Githeko is interviewed regarding his findings from the research project on malaria in the Kenyan highlands	Nairobi	Print	English
3	April-May 2009	ScienceAfrica	Launching AfricaAdapt	Article covers the launch of CCAA's knowledge sharing initiative *AfricaAdapt*	Nairobi	Print	English
4	April-May 2009	ScienceAfrica	Value Added Weather Forecasts	Article highlights the CCAA- supported project IGAD Climate Applications and Predictions Centre (ICPAC)	Nairobi	Print	English
5	8 April 09	Le Quotidien	Mise en place d'un fonds de soutien aux stratégies locales	Article covers the launch of a new fund that will support adaptation efforts led by at-risk groups in West Africa	Senegal	Web	French
6	22 April 09	Sud Quotidien	«L'Acca lance un programme continental Changements climatique et vulnérabilités urbaines en Afrique »	Article announces the launch of the CCAA Urban Vulnerabilities Call for Proposal	Sénégal	Web	French
7	22 April 09	Tam Tam Canada (RCI)	Henri Lo on Tam Tam Canada	Henri Lo speaks about the Urban Vulnerabilities Call for Proposal	Canada	Radio	French

	Date	Outlet	Title	Content	Location	Media	Language
8	27 April 09	The Cutting Edge	Experts Probe Links Between Urban Growth and Climate Change in Africa	Article discussing the links between urban growth and climate change in Africa	International	Web	English
9	29 April 09	Dowjones Business News	African Union Climate Change Monitoring Station Launched	Article on the launch of an African Union a climate change monitoring station	Addis Abba, Ethiopia	Web / Print	English
10	04 May 09	Sidwaya	« Changements climatiques : Ouagadougou prépare une riposte contre les risques »	Article discusses the impacts of climate change in Ouagadougou and the steps being taken to mitigate risks by CCAA projects	Burkina Faso	Web	French
11	4 May 09	The Daily Nation	State called on to harmonise Ministry functions	Kenyan researchers advocate for a national adaptation policy and ICPAC Knowledge Sharing Officer Abebe Tadeye Tsehayu notes the relevance of AfricaAdapt in sharing climate information	Mombasa	Web	English
12	5 May 09	Ciênciahoje: Journal of Science, Technology and Entrepreneur-ship of Portugal	"Investigadores procuram soluções para alterações climáticas em países lusófonos"	Article outlining CCAA projects in Sao Tomé and Principe	Portugal	Print / Web	Portuguese
13	18-24 May 09	The East African Focus	“Climate Change Search for Solution”	Article highlights the CCAA project joining Nyganyi rainmakers with scientists to predict weather patterns	Kenya	Print / Web	English

	Date	Outlet	Title	Content	Location	Media	Language
14	20 May 09	Libération	"Depuis une quarantaine d'années, le Maroc est soumis à des conditions difficiles"	Article covers the roundtable discussion of the adaptation projects in the region at the 7th CCAA Advisory Board Meeting in Agadir, Morocco	Morocco	Web	French
15	4 June 09	Agence de Presse Sénégalaise	"L'UCAD organise une série d'exposés, vendredi"	Article describing International Environment Day events organized by Université Cheikh Anta Diop in Dakar, where Henri Lo addressed climate change adaptation strategies	Senegal	Web	French
16	4 June 09	Soussdraa	(In Arabic)	Article covers the 7th CCAA Advisory Board Meeting in Agadir, Morocco	Africa & Middle East	Web	Arabic
17	6 June 09	Ennow.net	(In Arabic)	Article covers the 7th CCAA Advisory Board Meeting in Agadir, Morocco	Africa & Middle East	Web	Arabic
18	7 June 09	Alarab online	(In Arabic)	Article covers the 7th CCAA Advisory Board Meeting in Agadir, Morocco	Africa & Middle East	Web	Arabic
19	17 June 09	All Africa	Côte d'Ivoire: Sécheresse et inondations - Quatre pays ouest-africains adoptent des stratégies à Korhogo	Article covering the launch of CCAA funded project in Cote d'Ivoire "Water, Health and Climate Change Adaptation in Africa" led by the Centre Suisse de recherches scientifiques en Cote d'Ivoire	Africa	Web	French
20	22 June 09	Abidjan.net	"Changements climatiques : Inondations…la Suisse au secours"	Article describing the launch of CCAA funded project in Cote d'Ivoire "Water, Health and Climate Change Adaptation in Africa" led by the Centre Suisse de recherches scientifiques en Cote d'Ivoire	International	Web	French
21	27 June 09	Sunday Nation	"Rising Sea Could Swallow Mombasa in 20 years"	Article quotes CCAA Program Officer Victor Orindi and his contribution to a chapter in the book "Adapting Cities to Climate Change"	Kenya	Print	English

	Date	Outlet	Title	Content	Location	Media	Language
22	29 June 09	IRIN News	GLOBAL: Climate change information for the poor	Article sights Communications Officer, Mary O'Neill on the importance of communicating climate information and adaptation research	International	Web	English
23	29 June 09	Global Progress Blog	New fund for innovative knowledge sharing launched by AfricaAdapt	This blog discusses the Knowledge Sharing Innovation Fund, made available as part of the CCAA-funded network, AfricaAdapt	International	Blog	English
24	15 July 09	Sud Online	Le réseau des politiques de pêche en Afrique de l'Ouest se penche sur la question	This article covers a press briefing discussing the threats climate change presents on fisheries in West Africa and adaptation strategies as part of the CCAA project 'Adaptation des politiques de pêche aux changements climatiques en Afrique de l'Ouest à l'aide de savoirs scientifiques et de connaissances endogènes'	International	Web	French
25	16 July 09	Le Soleil	Climat et Ressources Halieutiques: Près de 100,000 acteurs directement menacées	This article covers a press briefing discussing the threats climate change presents on fisheries in West Africa and adaptation strategies as part of the CCAA project 'Adaptation des politiques de pêche aux changements climatiques en Afrique de l'Ouest à l'aide de savoirs scientifiques et de connaissances endogènes'	Senegal	Web	French
26	16 July 09	Walfadjri	Surexploitation des ressources halieutiques, changements climatiques… : Six cent mille emplois menacés dans le secteur de la pêche au Sénégal	This article covers a press briefing discussing the threats climate change presents on fisheries in West Africa and adaptation strategies as part of the CCAA project 'Adaptation des politiques de pêche aux changements climatiques en Afrique de l'Ouest à l'aide de savoirs scientifiques et de connaissances endogènes'	International	Web	French
27	23 July 09	MEA Bulletin	Knowledge Sharing for Climate Change Adaptation in Africa: Opportunities and	This article covers a press briefing discussing the threats climate change presents on fisheries in West Africa and	International	Web	English

	Date	Outlet	Title	Content	Location	Media	Language
			Challenges	adaptation strategies as part of the CCAA project 'Adaptation des politiques de pêche aux changements climatiques en Afrique de l'Ouest à l'aide de savoirs scientifiques et de connaissances endogènes'			
28	24 July 09	SciDev	Fund to Promote African Climate Change Adaptation	This articles highlights the Knowledge Sharing Innovation Fund, as part of the CCAA-funded adaptation network, AfricaAdapt	International	Web	English
29	11 August 09	Arid Lands Information Network – Joto Afrika	Joto Afrika – Africa is Feeling the Heat	This article highlights the editing work of program officer Victor Orindi for the first issue of 'Joto Afrika', a quarterly briefing on adaptation supported by AfricaAdapt in partnership with ALIN and the Institute for Development Studies	International	Web	English
30	3 Sept 09	La Presse	La famine frappe durement l'Afrique de l'Est	Editorial by CCAA Program Manager Simon Carter examines the effects of climate change on drought and famine in the context of the current food crisis in East Africa	Canada	Web	French
31	4 Sept 09	SciDev.net	Climate change — adapting is crucial too	CCAA Partner Abdelouahid Chriyaa stresses the importance of technology transfer and knowledge-sharing for local populations to access information on adaptation to climate change.	International	Web	English
32	7 Sept 09	The Hill Times Policy Briefing	Protecting the Vulnerable in a Changing Climate: Lessons from the South	CCAA Program Manager Simon Carter urges Canadians to contemplate the global effects of climate change by highlighting the implications for vulnerable communities in the global South and their attempts to adapt in stressed environments.	Canada	Print/Web	English
33	9 Sept 09	Eldis.org	Informing and Involving Farmers in Benin	CCAA project profile of Benin is featured on Eldis.org, a knowledge service from the University of Sussex intending to	International	Web	English

	Date	Outlet	Title	Content	Location	Media	Language
				share information and knowledge on development			
34	10 Sept 09	Western Producer	Millions of Kenyans in Dire Situation	In this editorial, CCAA Program Manager Simon Carter examines the effects of climate change on food security, drought and famine in the context of the current crisis in East Africa.	Canada	Print	English
35	17 Sept 90	ACCID	Lights, camera, action: the media's role in the climate change debate	This article discusses the role of broadcasters in raising public awareness and action on climate change, highlighting the effort of the AfricaAdapt knowledge sharing network	Africa	Web	English
36	19 Sept 09	Agence-France Press	Kenya rainmakers called to the rescue	This article discusses the use of both indigenous and scientific knowledge in predicting weather patterns in CCAA project in Northern Kenya	Europe	Web	English
37	13 Oct 09	Scidev.net	Benin farmers unite against effects of climate change	The unique role of agricultural 'field schools' in conducting research and disseminating information on climate change is featured in this article on a CCAA supported project led by PARBCC in Benin	International	Web	English
38	27 Oct 09	Le Matin Maghreb Arab Presse	Quand l'adaptation aux effets climatiques devient nécessité	This article quotes Abdellatif Khattabi, leader of CCAA supported project « Enabling Stakeholders in Moroccan Coastal Management ».	Morocco	Web	French
39	5 Nov 09	Wa Bayn	Rencontre régionale sur l'adaptation aux changements climatiques au Maghreb	This article describes the upcoming CCAA supported conference on "L'adaptation aux changements climatiques au Maghreb:Bilan et Perspectives" organized by Comité National du Programme International Géosphère- Biosphère (IGBP).	Morocco	Web	French

	Date	Outlet	Title	Content	Location	Media	Language
40	17 Nov 09	Mediaterre	Bourses de recherche sur les Forêts du Bassin du Congo et Adaptation au Changement Climatique	This article discusses a research bursary for CCAA partners Centre pour la Recherche Forestière Internationale (CIFOR)	International	Web	French
41	25 Nov 09	START website	ACCFP Fellows Participate in Climate Change Adaptation in Africa (CCAA) Board Meeting, in Cape Town, South Africa	START ACCFP Fellow Felix Orolunfemi blogs on the CCAA roundtable held in Cape Town, South Africa in November 2009	International	Web	English
42	November 2009	Arid Lands Information Network	Joto Afrika: Managing Climate Risk South Africa's Western Cape	An article summarizing the research from project "Managing climate risk for agriculture and water resources development in South Africa". CCAA Advisory Board member Balgis Osman-Elasha, is also the guest editor of volume 2 of Joto Afrika	International	Web	English / French
43	1 Dec 09	Business Today Egypt	Holding Back the tide: Rising Water Level threatens millions in Delta	CCAA Program Officer Guy Jobbins is interviewed in this article on sea-level rise in the Nile Delta region of Egypt	Egypt	Web	English
44	1 Dec 09	DFID website	If the weatherman says its raining…	Photo essay of the CCAA research project Integrating Indigenous Knowledge with Nyganyi rainmakers in Kenya	UK	Web	English
45	2 Dec 09	CBC Radio	Simon Carter : Coping with Climate Change in East Africa	Simon is interviewed by CBC Radio Canada about the drought in East Africa	Canada	Radio	English
46	3 Dec 09	Sud Online	750 milliards de dollars pour changer de monde	This article highlights CCAA supported research of the InfoClim project in Senegal	Senegal	Web	French
47	4 Dec 09	Nation TV		An interview with Program Officer, Evans Kituyi was broadcasted by Nation TV prime time evening news on COP 15 and Climate change in Africa	Kenya	TV	English

	Date	Outlet	Title	Content	Location	Media	Language
48	9 Dec 09	Globe & Mail	In Africa: Not Guilty, but Paying the Price	In this article on Africa's vulnerability to climate change, the work of two CCAA research projects are cited as examples of adaptation efforts on the continent.	Canada	Print/Web	English
49	10 Dec 09	Le Messager	L'Afrique face aux changements climatiques: s'adapter ou perir	CCAA is cited as a source for this article on Africa's climate change vulnerability in areas like disaster and coastal management	Senegal	Web	French
50	14 dec 09	Farm Radio Weekly	Awareness of Climate Change: an Issue Pack	CCAA-supported research in highlighted in this Farm Radio Weekly the script from a broadcast of climate change adaptation in Africa during the Copenhagen Summit.	Nigeria	Radio	English
51	18 Dec 09	The Independent	Rooibos tea farmers on the front line of climate change	An article and photo essay on CCAA supported research led by Indigo Development and Change with rooibos tea growers in South Africa's Northern Cape, the Community Based Adaptation project (104898).	UK	Print/Web	English
52	22 Dec 09	Presse Afrik	Sommet de Copenhague : l'apport du programme ACCA du CRDI aux pays africains	This article notes the contribution of the CCAA program to adaptation efforts in Africa and quotes Research Officer Alioune Kaere on the COP15 climate negotiations	Africa	Web	French
53	28 Dec 09	Agence de Presse Senegalaise	Thiès : quatre collectivités locales bénéficient d'un projet d'adaptation aux changements climatiques	This article highlights CCAA supported research of the InfoClim project in Senegal	Senegal	Web	French
54	31 Dec 09	The Guardian	Climate change increasing malaria risk, research reveals	Article discussing CCAA-supported research on the effects of climate change on malaria in Kenya's Central Highlands	UK	Web	English

	Date	Outlet	Title	Content	Location	Media	Language
55	4 Jan 10	The Ecologist	Climate change increasing malaria risk, research reveals	Article discussing CCAA-supported research on the effects of climate change on malaria in Kenya's Central Highlands	UK	Web	English
56	9 Jan 10	Forum for Agricultural Research in Africa (FARA) blog	Climate Change Adaptation in Africa: COP15 What's at stake for African?	Opinion piece on Africa at COP 15 by CCAA Research Officer Alioune Kaere is featured on the FARA blog and in a news article	Africa	Blog	English
57	19 Feb 10	The Independent	Indigenous Knowledge Meets Science	Article and photo essay discussing the integration of indigenous and scientific knowledge in the CCAA project with Nganyi communities in Northern Kenya	UK	Web	English
58	24 Feb 10	Le Soleil	Peche et Changements Climatiques: Définition des stratégies d'adaptation à l'échelle régionale	Article features CCAA supported West African Fishing Policy project at a regional conference with decision-makers, fishermen, and stakeholders (REPAO) in Dakar, Senegal	Senegal	Web	French
59	24 Feb 10	Agence de Presse Senegalaise	Les changements climatiques rendent plus complexes les difficultés de la pêche (REPAO)	Article features CCAA supported West African Fishing Policy project at a regional conference with decision-makers, fishermen, and stakeholders (REPAO) in Dakar, Senegal	Africa	Web	French
60	25 Feb 10	SudOnline	L'Afrique de l'Ouest condamnée à mutualiser ses ressources	Article features CCAA supported West African Fishing Policy project at a regional conference with decision-makers, fishermen, and stakeholders (REPAO) in Dakar, Senegal	Senegal	Web	French
61	2 March 10	El Moudjahid	Changements climatiques en Afrique : Evaluation à Alger des projets de recherche	This article covers a synthesis workshop in Algiers, March 1-5, 2010, to evaluate the project's mentoring process and draw lessons to inform future application of the PAR approach for research on climate change adaptation.	Algeria	Web	French
62	March 10	New Agriculturalist	Safeguarding Madagascar's biodiversity	The climate change adaptation strategies of CCAA project partners in Antananarivo are highlighted in this article, in light of Madagascar's struggle to preserve biodiversity.	Global	Web	English

	Date	Outlet	Title	Content	Location	Media	Language
63	25 March 10	MediaGlobal	Climate change affects rainmakers' predictions	This article discusses the difficulty for indigenous Nyganyi rainmakers to make weather prediction in the face of a changing climate	Global	Web	English

2008-2009 Media Coverage – 40 hits

	Date	Outlet	Title	Content	Location	Media	Language
1	02 April 2008	Le Pays	CNRST-FRSIT-CRDI Un projet pour accroître l'efficience du système d'innovation	Article on the launch of project "Analyzing Innovation Systems (Burkina Faso)"	Burkina Faso	Print	French
2	16 April 2008	Le Pays	Burkina Faso: Organisations paysannes de la CEDEAO - La sécurisation foncière au centre des débats	Article on the launch of project "Securing Land Tenure, Improving Food Security and Reducing Poverty in Rural West Africa"	Burkina Faso	Print	French
3	28 April 2008	Wal Fadjri	Sénégal: le centre de suivi écologique lance le projet 'infoclim' - l'impact des carrières sur le changement climatique à Thiès	Article on the launch of project "InfoClim : Platform for Helping Vulnerable Communities Adapt to Climate Change"	Senegal	Print	French

	Date	Outlet	Title	Content	Location	Media	Language
4	May 2008	Science in Africa	Managing climate change in South Africa's Western Cape	Article featured in journal regarding CCAA project in South Africa	Africa	Web	English
5	08 May 2008	L'Observateur Paalga	Changements climatiques en Afrique 'symbiose autour de la gestion de l'eau'	Article on the launch of project in Burkina Faso	Burkina Faso	Print	French
6	June 2008	South African Fruit Journal	Climate Change in the Western Cape: Integrated Approach to Adaption and Mitigation	Article features CCAA project "Managing climate risk for agriculture and water resource development in South Africa: Quantifying the costs, benefits and risks associated with associated with planning and management alternatives"	South Africa	Print	English
7	July 2008	Science Africa	Africa Most Vulnerable to Climate Change	Articles part of the Climate Change - IDRC Lectures	Africa	Print	English
8	01 July 2008	Daily Nation	Scientists in rare joint-project with traditional rainmakers	CCAA Program Office Anthony Nyong quoted in feature article about the joint-project with scientists and traditional rain-makers in Kenya	Kenya	Print	English
9	02 July 2008	African Development Bank Group	Bank Group Holds Workshop on Climate Change Adaptation in Africa	Article to announce a training workshop for the Bank's operational staff	International	Web	English
10	5 July 2008	The Toronto Star	World looks to science to solve food crisis	CCAA Program Officer is quoted in feature article regarding the food crisis	Canada	Print & Web	English

	Date	Outlet	Title	Content	Location	Media	Language
11	21 July 2008	Inter Press Service News Agency	Environment-South Africa: Western Cape Farmers Expect the Unexpected	Article highlighting CCAA project in South Africa's Western Cape	International	Web	English/ French
12	25 July 2008	University of Guelph	Profs, Students Develop Radio Drama For Nigerian Farmers	Article featuring the University's involvement with the project "Strengthening the Capacity of Smallholder Farmers to Adapt to Climate Change through Radio Drama (Nigeria)"	Canada	Web	English
13	26 July 2008	Le Quotidien	Région Atsimo Andrefana: Systèmes agraires vulnérables	Article highlighting CCAA projects in the Atsimo Andrefana region	Madagascar	Print	French
14	August 2008	Source unknown	Experts to meet in Nairobi August 18-27 for Workshops to address the Critical Issue of Climate Change and Food Security	Press release announcing the workshop with information regarding the CCAA program	Nairobi	Print	English
15	15 August 2008	Reuters AlertNet	Who's helping media in developing countries tackle climate change?	Article on climate change journalism in Africa	International	Web	English
16	20 August 2008	Le Quotidien	The Economic Consequences of Climate Change –IDRC and ROPPA launch a research fund	CCAA Program Officer Henri Lo quoted in article featuring the project "IDRC Research Partnerships Challenge Fund"	Senegal	Web/Print	French
17	26 August 2008	Le Quotidien	Monde agricole de la region Boeny: Prêt à faire face aux changements climatiques	Article reports on the first regional meeting of a CCAA project in Boeny, Madagascar	Madagascar	Print	French
18	28 August 2008	The Daily National	Whither agriculture admist climate change?	Article reports on agriculture project funded by CCAA in Malawi	Malawi	Print	English

	Date	Outlet	Title	Content	Location	Media	Language
19	Sept-Oct 2008	Découverte	Le Maroc face aux changements climatiques	Article on CCAA-supported Moroccan coastal resource project led by ENFI	Canada (Quebec)	Print	French
20	08 September 2008	Mediaglobal	The elephant in a warming room: Media in developing countries struggle to give global climate change local coverage	CCAA Communications Officer Mary O'Neill quoted in feature article on climate change adaptation	International	Web	English
21	18 October 2008	Sud Quotidien	Innocent Butare: "It will be difficult to achieve food self-sufficiency without courageous decisions"	Interview with Program Officer Innocent Butare concerning the effects of climate change on food security	Senegal	Print	French
23	22 November 2008	The Guardian	Adapting to Effects of Climate Change	CCAA Advisory Board Chair Shem Wandiga and Tanzania partners quoted in feature article following November Board meeting and field visit in Tanzania	Tanzania	Print	English
24	23 November 2008	Le Matin	Réchauffement climatique : Il faut se préparer à la montée des océans : Un atelier international sera organisé les 26 et 27 novembre à Marrakech	Article announcing the CCAA conference in Marrakesh	Morroco	Web	French
25	28 November 2008	Sud Quotidien (repris par allAfrica.com)	L'adaptation pour faire face : Changements climatiques en afrique	Article announces CCAA press conference in Dakar, Senegal	Senegal	Print	French
26	01 December	El Watan	Conclusions de l'atelier international sur le climat au Maroc : Les climatologues maghrébins	CCAA Morocco partners quoted on their views on COP 14 outcomes at conclusion of Maghreb workshop on climate change	Morocco	Print	French

	Date	Outlet	Title	Content	Location	Media	Language
			n'attendent rien de Poznan				
27	04 December 2008	LEISA Magazine	Farmers perceptions lead to experimentation and learning	Article summarizes learning experiences and opportunities in seven African countries	International	Print	English
28	05 December 2008	El Watan	Guy Jobbins: « Un projet à l'étude en Algérie »	Interview with Program Officer Guy Jobbins regarding CCAA projects in North Africa and the Middle East	Morocco	Print	French
29	09 December 2008	Le Nation	Changements climatiques: quand l'homme pourrit son propre cadre de vie!	Article highlights CCAA projects in Benin	Benin	Print	French
30	11 December 2008	DFID R4D	Adapting to climate variability and climate change in Tanzania	Article highlights programs in Tanzania managed by CCAA	International	Web	English
31	12 December 2008	Sud Quotidien	Les nouvelles clés pour l'Afrique	Article highlights proceedings from the Climate Change: Risk Management Conference in Nairobi	Kenya	Web/Print	French
32	17 December 2008	Afrique en ligne (PANA)	Senegalese peasant farmers using scientific information against climate change impact	Article highlights visit by CCAA President David Malone to the Thies region of Senegal where the InfoClim project is operating.	International	Web	English/ French
33	19 December 2008	Sud Quotidien	Observatoire sur les changements climatiques : un modèle de partage des savoirs	Article highlights visit by CCAA President David Malone to the Thies region of Senegal where the InfoClim project is operating.	Senegal	Web & Print	French

	Date	Outlet	Title	Content	Location	Media	Language
34	26 December 2008	Inter Press Service News Agency	Climate change threatens livelihoods	CCAA Program Officer Miriam Kalanda-Sabola quoted in feature article concerning the effects of climate change on the Zambezi River basin	International	Web	English
35	29 December 2008	L'Observateur (repris par allAfrica.com)	Burkina Faso: Changements climatiques - Demain se prépare aujourd'hui	Article highlights CCAA project in Burkina Faso	Burkina Faso	Web & Print	French
36	05 January 2009	IRIN (Integrated Regional Information Networks)	Senegal: Forecasting the future in an erratic climate	CCAA Program Officer Fatima Denton quoted in feature article on forecasting weather in a time of climate change	International	Web and electronic bulletin	English
37	January 2009	IRIN (Integrated Regional Information Networks)	Paul Thiao, "Farmers have become gamblers"	CCAA partner featured in article regarding Senegalese farmers adapting to climate change	International	Web and electronic bulletin	English
38	01 January 2009	Sud Quotidien	Peches : Devant l'épuisement de la ressource halieutique	Article reports on a regional fishing conference supported by CCAA	Senegal	Web	French
39	13 February 2009	Radio Canada	Le monde selon Mathieu	Interview with Program Officer Fatima Denton following Ottawa panel "Protecting the Vulnerable in a Changing Climate"	Canada	Radio	French
40	March 2009	Kenya Broadcasting Corporation	TBC	IDRC president David Malone visit to ICPAC project on indigenous knowledge	Kenya	TV	English

2007-2008 Media Coverage – 18 hits

	Date	Outlet	Title	Content	Location	Media	Language
1	04/04/2007	CBC National News	N.A.	Host Peter Mansbridge interviewed CCAA program officer Guy Jobbins on what Canada is doing to help Africa adapt to climate change.	Canada	TV	English
2	13/04/2007	Nature Journal	How to survive a warming world	CCAA program officer Guy Jobbins quoted in feature article on African communities have been adapting to climate change.	International	Print	English
3	17/04/2007	The Daily Monitor	Africa Urged to Do More On Climate Change	(CCAA inception workshop) Africa governments need to do more on mitigating the devastating effects of climate change and boost adaptation capacity	Ethiopia	print	English
4	19/04/2007	UNECA Web site	Africa will be severely affected by climate change, and must enhance coping strategies, expert says	CCAA team leader Fatima Denton quoted in article about joint CCAA-UNECA regional workshop	Africa/ international	Web	English
5	19/04/2007	Linkages Africa (IISD)	CLIMATE CHANGE ADAPTATION IN AFRICA	Summary of CCAA-UNECA joint workshop on regional sharing of climate change knowledge and adaptation strategies	International	Web	English
6	27/06/2007	La Nation	Un projet pour renforcer les capacités des	Article on the launch of CCAA supported project "Informing and Involving Rural Stakeholders in Benin"	Benin	print	French

	Date	Outlet	Title	Content	Location	Media	Language
			producteurs Béninois				
7	27/06/2007	Le Republicain	Les acteurs ruraux en atelier pour le renforcement de leurs capacités	Article on the launch of CCAA supported project "Informing and Involving Rural Stakeholders in Benin"	Benin	print	French
8	27/06/2007	La Richesse Info	Atelier du lancement d'un projet pour la lutte contre la rechauffement climatique	Article on the launch of CCAA supported project "Informing and Involving Rural Stakeholders in Benin"	Benin	print	French
9	29/06/2007	Adjinakou	CC au Benin: A quand des mésures pour faire face aux impacts?	Article on the impacts of CC in Benin, and the role of research. CCAA-supported PARBCC project highlighted	Benin	print	French
10	10/07/2007	IRIN News (UNHCR)	AFRICA: Climate change will impede development, warn experts	CCAA program officer Anthony Nyong quoted in article about a regional release of the IPCC report	International	Web	English
11	20/07/2007	Adjinakou	Réalisation du PARBCC: Les ONGs impliqués recoivent des matérials	Report on "handover ceremony" of materials to NGOs within CCAA project involving rural stakeholders in Benin	Benin	Print	French
12	22/07/2007	Los Angeles Times	Kenya's malaria-free areas feel sting	CCAA research partner Andrew Githeko (KEMRI) and advisory board chair Shem Wandiga quoted in this article on research addressing the expanding range of malaria in East Africa	USA	Print	English

	Date	Outlet	Title	Content	Location	Media	Language
13	01/08/2007	SciDev.net	Africa and climate change: Adapt, survive, thrive?	CCAA team leader Fatima Denton, and CCAA partner Henry Mahoo of Sokoine University of Agriculture in Tanzania quoted in this feature article on the CC challenges facing Africa	International	Web	English
14	01/08/2007	SciDev.net	Africa cannot turn a blind eye to climate change	Opinion piece by CCAA program officer Tony Nyong on the need for African policymakers to engage on CC	International	Web	English
15	25/09/2007	Daily Mirror	Africa: Minister underscores need for relying one own research for solutions strong solution maker partnership urged	Africa must depend on its own researchers to curb its problems replacing existing ones that are donor-driven and therefore impractical State Ministere Abeera Dheeresa told at the regional workshop on research proposal development.	Ethiopia	print	English
16	07/12/2007	ENB on the Side (IISD)	Day 4 at Climate talks: Adapting to climate change in Africa: towards regional solutions	Highlights from CCAA-OSS side event at UNFCCC COP 13	International	web and print	English
17	11/12/2007	ResearchSEA	Adapting to Climate Change: IDRC at COP 13 in Bali	Pick up of IDRC press release on CCAA events in Bali for COP 13	International	web	English
18	01/03/2008	Development Outreach (World Bank Institute)	Adapting to Climate Change in Africa The role of research and capacity development	Article on CCAA co-authored by Fatima Denton, John Stone and Mary O'Neill	International	print and web	English

2006-2007 Media Coverage - 17 hits

	Date	Outlet	Title	Content	Location	Media	Language
1	17 May 06	BBC Radio Five Live	*Up All Night* show	Live interview with Program Manager Simon Carter	UK	Radio	English
2	18 May 06	SciDev.Net	$60 million to research African climate change	Article on the program following its launch	International	Web	English
3	18 May 06	South Africa Broadcasting Corporation, Online Edition	$60 million to research African climate change	Article on the program following its launch	South Africa	Web	English
4	19 May 06	*Green Consumer Guide*	Africa gets climate change funding	Article on the program following its launch	International	Web	English
5	23 May 06	African News Dimension Online	Africa to get US$60 million for climate research	Article on the program following its launch	Africa/ International	Web	English
6	12 June 06	Radio Canada International	Le Canada en direct – Afrique subsaharienne	Interview with Jean Lebel regarding the newly launched CCAA program	Canada	Radio	English
7	13 June 06	Radio Canada International	Canada Today to Africa	Interview with Jean Lebel regarding the newly launched CCAA program	Canada	Radio	English

	Date	Outlet	Title	Content	Location	Media	Language
8	20 June 06	Research Africa	Bulletin	Highlights CCAA's first call for concept notes	Africa/ International	Web	English
9	7 November 06	Egypt Daily Star	Millions in Egypt Could Suffer from Climate Change	Draws on interview with IDRC's Rawya El-Dabi and mentions CCAA following activities at COP 12 in Nairobi.	Egypt	Web	English
10	8 November 06	Egypt Gazette	Helping Africa Cope with Climate Change	Following activities at COP 12 in Nairobi.	Egypt	Web	English
11	8 November 06	Islam Online	Adapting to a Warmer Earth	Following activities at COP 12 in Nairobi.	International	Web	English
12	17 November 06	Development Gateway Online	Helping Africa Cope with Climate Change: Canada's IDRC at UN Climate Conference in Nairobi	Following activities at COP 12 in Nairobi.	International	Web	English
13	7 November 06	Nigeria News Agency	Strengthened capacity: Africa's Remedy to Climate Change	Following activities at COP 12 in Nairobi.	Nigeria	Web	English
14	2 November 06	ENB On the Side	Special Report on Side Events at COP 12	Following activities at COP 12 in Nairobi	International	Web	English

	Date	Outlet	Title	Content	Location	Media	Language
15	23 November 06	Tide Online	African Leaders urged to link climate change to development	Following activities at COP 12 in Nairobi	International	Web	English
16	Date unavailable	Lagos Daily Independent	Climate Change may Crush Nigeria's Power Generation, Says Scientist	Following activities at COP 12 in Nairobi	Nigeria	Web	English
17	22 January 07	Deutschlandfunk (German national radio station)		Interview with Anthony Nyong regarding COP 12	Germany	Radio	English

Annex 3-3: Annual Reports and Publications

Program Strategy

Adaptation : Climate Change Adaptation in Africa (CCAA) Research and Capacity Development Program; program strategy overview
Kaeré, Alioune Badara; O'Neil, Mary, 2007

Adaptation Stories

Adaptation : stories
Denton, Fatima; Badara Kaéré, Alioune; Lo, Henri Matthieu; Thiao, Ibrahima Paul; IDRC; DFID, 2010

Annual Reports

Adaptation: Climate Change Adaptation in Africa; annual report 2006-2007
International Development Research Centre (IDRC), 2006-2007

CCAA annual report 2007-2008: enhancing African adaptation to climate change
International Development Research Centre (IDRC), 2007-2008

Uncertain horizons : preparing Africa for a changing climate; Climate Change Adaptation in Africa program - 2008-09 year in review
IDRC. Climate Change Adaptation in Africa (CCAA); Department for International Development (DFID), 2008-2009

Annual Report – Collection 2009-2010

CCAA research-to-policy links : mapping our partners' engagements

Reflections : providing monitoring and evaluation support for CCAA projects

Reflections : strengthening our approaches to building capacity

Reflections : strengthening research's influence on adaptation policies in Africa

Publications-CCAA - 2009-10

Stories from the field : adapting fishing policies to address climate change in West Africa

Stories from the field : balancing competing water needs in Morocco's Saiss basin

Stories from the field : protecting smallholders' food security by improving soils

Stories from the field : reducing vulnerability among pastoralists in Northern Kenya

Strategies-CCAA 2009-2010

Climate Change Adaptation in Africa Program : 2009-10 in brief

Annual Report – Collection 2010-2011

Investments

Measuring our reach

Reflections : approaching climate change adaptation as a means to reduce poverty

Reflections : making an adaptation network work for Africa

Reflections : using participatory action research to manage uncertainties in adaptation

Stories from the field : addressing leishmaniasis in Tunisia's changing climate

Stories from the field : confronting sea level rise on Egypt's Nile Delta coast

Stories from the field : helping African cities prepare for climate change

Stories from the field : weathering drought in the Greater Horn of Africa

Strategies

Climate Change Adaptation in Africa Program : 2010-11 in brief

Adaptation is Series

Adaptation is - predicting malaria's changing course in East Africa
Rapuro, Ochieng, 2007

Adaptation is – informing and involving farmers in Benin
Rooyen, Christa Van, 2007

Adaptation is - managing climate risk in South Africa’s Western Cape
Gologo, Habibatou, 2007

Adaptation is - protecting coastal communities in Northern Morocco
O'Neill, Mary, 2009

Integrating meteorological and indigenous knowledge-based seasonal climate forecasts for the agricultural sector : lessons from participatory action research in sub-Saharan Africa
Ziervogel, Gina; Opere, Alfred, 2010

Annex 3-4: Climate Change Adaptation in Africa (CCAA) on the IDRC Website

CCAA Program Publications on the IDRC Website

For the duration of the program, CCAA used its web pages on the IDRC website to share program publications and highlight project outputs. While the CCAA program entrance page was removed at the end of the program, content is still available at the links below.

- Adaptation Stories
- Adaptation Is… Series
- Map of CCAA Policy Links
- Looking upstream and down: Addressing climate change impacts in Accra and Addis Ababa
- When every drop of rain counts: Managing climate risks in the Greater Horn of Africa
- Facing the tide: Weighing options to protect Egypt's Nile Delta coast
- CCAA Resources on M&E
- Managing Uncertainty in Adaptation
- Policy brief: Tailoring climate information to user needs
- CCAA learning paper: Integrating meteorological and indigenous knowledge-based seasonal forecasts for the agricultural sector
- A new vision for AfricaAdapt: Interview with Moussa Na Abdou Mamouda
- CCAA mid-term review
- What's at stake for Africa? (COP15)
- Towards a regional strategy on adaptation to climate change in West Africa
- Kenya develops tool to predict malaria
- Protecting the vulnerable in a changing climate: Lessons from the South
- Climate change affects rainmakers' predictions
- Reference Guide and Fact Sheets: PAR for Agricultural Adaptation in Africa

CCAA Research Results on the IDRC Website

Project Number	*Project Title*	*Web Article*
104140	Resilience and the African Smallholder : Enhancing the Capacity of Communities to Adapt to Climate Change	Mobilizing local safety nets for enhanced adaptive capacity to climate change in Zimbabwe
104141	Strengthening Local Agricultural Innovation Systems in Less Favoured and High Potential Areas of Tanzania and Malawi	Impacts of climate change and variability, and adaptation strategies on agriculture in semi-arid areas of Tanzania
104142	Strengthening the Capacity to Adapt to Climate Change in Rural Bénin	How can Political and Administrative Authorities Contribute to Local Community Adaptation to Climate Change in Benin?
104142	Strengthening the Capacity to Adapt to Climate Change in Rural Bénin	Agro-meteorological early warning to reduce agricultural vulnerability to climate change: The experiences of PARBCC in Benin
104143	Vulnerability and Adaptation of Agricultural Systems in Madagascar	Adaptive Options for Growing Atriatry Rice in the Context of Climate Change : The Case of Marovoay
104143	Vulnerability and Adaptation of Agricultural Systems in Madagascar	Adapting to cyclones in Madagascar's Analanjirofo region
104143	Vulnerability and Adaptation of Agricultural Systems in Madagascar	Vulnerability and Adaptation to Climate Change: Agricultural Systems in Madagascar
104146	Managing Risk, Reducing Vulnerability and Enhancing Productivity Under a Changing Climate	Exploring farmers' perceptions of climate variation and change in semi-arid Kenya
104150	Managing Climate Risks for Agriculture and Water Resources Development in South Africa	Benefits and costs of coping with water and climate change: Berg River Basin, South Africa
104150	Managing Risk, Reducing Vulnerability and Enhancing Agricultural Productivity In a Changing Climate	Improving farmer adaptive capacity by integrating local and indigenous knowledge in climate forecasting
104329	Moroccan Coastal Management : Building Capacity to Adapt to Climate Change	Climate change's impact on Morocco's northeast coast
104391	African Climate Change Fellowship Program	Communicating Seasonal Forecasting for Agricultural Adaptation in Africa

Project Number	*Project Title*	*Web Article*
104683	Rural Urban Cooperation on Water Management in Burkina Faso	Using Participatory Testing to Build Capacity for Climate Change Adaptation in Burkina Faso
104707	Transferring the Malaria Epidemic Prediction Model to End Users in East Africa	Identifying malaria hotspots in the western Kenyan highlands
104752	Enhancing Adaptation to Climate Change among Pastoralists in Northern Kenya	Gender and climate change-induced conflict in pastoral communities: Turkana, Kenya
104795	InfloClim: Platform for helping vulnerable communities adapt to climate change	A Regional Observatory for Producers' Climate Change Adaptation in Thies, Senegal
104835	Altering the Climate of Poverty under Climate Change: the Forests of Congo Basin	Climate impacts, forest-dependent rural livelihoods and adaptation strategies in Africa: A review
104835	Altering the Climate of Poverty under Climate Change: the Forests of Congo Basin	The effects of climate change in the Congo basin: The need to support local adaptive capacity
104898	Community-based Adaptation to Climate Change in Africa (CBAA)	Adaptation and beyond: Lessons from community based adaptation in Africa
104955	AfricaAdapt	Negotiating Openness: Lessons from AfricaAdapt
105099	Promoting Participatory Action Research on Climate Change Adaptation in Africa through Structured Learning	Adaptation Insights: Lessons from participatory research in Africa
105602	Linking African Researchers with Adaptation Policy Spaces	Connecting Researchers and Policymakers for Climate Change Adaptation in Africa
106669	Technical Expert Network for High Quality Scientific Publications on Climate Change Adaptation	Recognizing Africa's climate change research